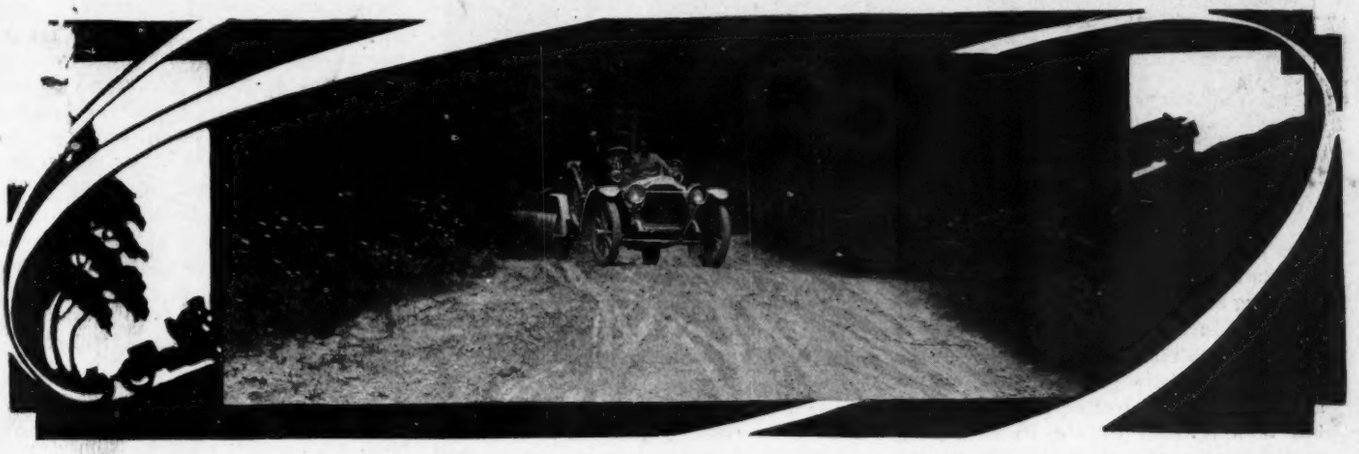
VOL. XIV No. 10 CHICAGO, SEPTEMBER 3, 1908 $3.00 PER YEAR

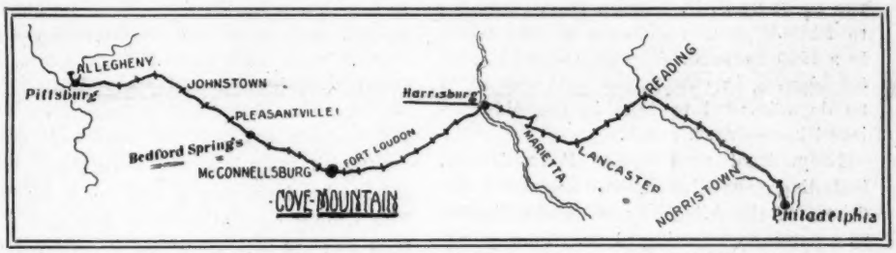
MOTOR AGE

COVE MOUNTAIN BECOMES A TESTING CAMP



THERE ARE 15,000 THANK-YE-MA'AMS BETWEEN PITTSBURG AND PHILADELPHIA

TESTING the finished product is one of the most important features in the manufacture of the motor car. A manufacturer may be ever so careful in the selection of the material which goes into his cars; he may hire the most expert workmen obtainable, but it is not until he has a chance to work out his cars on the road for speed and hill-climbing ability that he learns the true merits of his wares. Unfortunately, few makers are so situated that they find at their doors hills steep enough to prove what climbers their cars are, or roads good enough to demonstrate the speed of the machines. This condition of affairs is responsible for the million-dollar Brooklands track in England and also for the Long Island motor parkway which is now in course of construction in this country. But even these magnificent plants will not completely fill the bill.

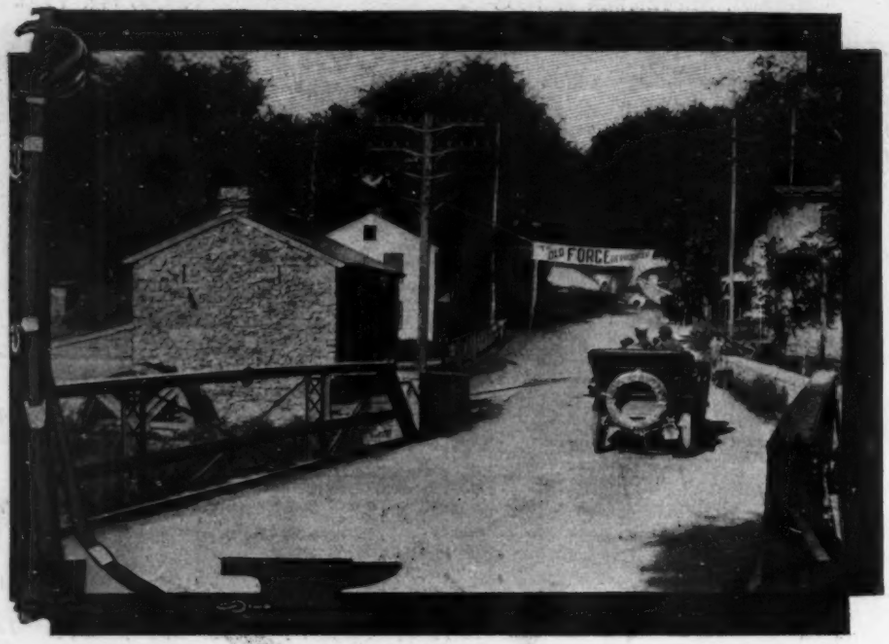


MAP OF PITTSBURG-PHILADELPHIA ROUTE SHOWING LOCATION OF COVE MOUNTAIN

Because of the failure of Nature to provide these grades at the factory doors or in the immediate vicinity, the manufacturer often has to resort to artificial means to secure such a testing ground. Now nearly every factory has its own private hill, artificially made of wood; but at best these are poor makeshifts—there's nothing that can equal the handiwork of old Dame Nature. Detroit is one of the big sufferers in this respect. The center of the motor car manufacturing industry, there are few hills there that are worthy of the name, so the makers of that city have been forced to look elsewhere for suitable substitutes.

HAIRPIN TURN ON THE OLD FORBES MILITARY ROAD

The need of hills is emphasized by the search made by the Packard Motor Car Co. After testing out the rough rifle ranges near Detroit and finding that even those grades were not severe enough, the Packard company had to turn to the history made by the last Glidden tour, and there it found what it wanted—a hill that was a hill—none other than the famous Cove mountain that was encountered the fourth day of the Glidden tour on the run



MAIN STREET LEADING INTO VALLEY FORGE

from Bedford Springs to Harrisburg. Cove mountain starts just outside of McConnellsburg and is a 3-mile climb over a good roadbed. Included in it are two horseshoe curves, one to the left and the other to the right. The entire grade, though, makes an ideal climb for testing purposes and it has been selected by the Packard company as a permanent testing place, this decision being reached following a record run made by S. D. Waldon from Pittsburg to Philadelphia, a distance of 304 miles, in a 1909 Packard. The time was 15 hours 58 minutes, in comparison with the 15 to 20 days it used to take in the old-fashioned horse-drawn coach.

Long, hard runs across Pennsylvania, including the Glidden, had suggested the fitness of the Alleghany mountain district as a permanent testing place. Consequently, a Packard camp was established at McConnellsburg and three experimental Packards were put through their paces in that vicinity. For a fortnight these cars were driven by different members of the Packard executive staff, engineering department, and men from the factory. Different parties of Packard dealers and several Packard owners were taken to the camp to see the cars perform over Cove mountain and other difficult stretches of road in the vicinity. So successful was the work accomplished and so extreme was the test given the cars, that the Packard company is preparing to erect a permanent garage on Cove mountain, near McConnellsburg, as headquarters for future testing of this sort.

The trip of the Packard forcibly impressed on the minds of the motorists that since the old stage-coach days times have changed and travel has changed, but the old Forbes military road, built more than a century ago across Pennsylvania, has changed but little. The wildly curveting stage, hitting the high spots as it bumped roughly and recklessly over the mountains, is merely a dim recollection. The road itself is coming into its own.

Along the road's eastern part the whole country has changed since the colonist generals engineered its making. Valley Forge attained a place in history and became an everlasting memorial to Washington. Gettysburg attained a place in history and became an everlasting memorial to Lincoln. Philadelphia spread its metropolitan airs over the vicinity and the Forbes road was graced with beautiful country estates and well-groomed suburban towns. The Pennsylvania Dutchman and the Quaker covered the road's original clay with macadam and dotted the hillsides with large barns and small houses. The trolley worked its way into the district and the tollgate changed its program to make motor cars the top-liner.

The western part of the Forbes road is the same old mountain highway. It is still a trunk line through a wild country, full of rattlesnakes, trees and rocks, where wide perspectives have no trace of habitation, cultivation or epulation. The road is an air line. It goes over the mountains as nearly straight as its builders were able to make it. In some places it is simply a traveled course on the naturally flat mountainside. In other places, it is a difficult hewn shelf in the native rock. It is fenced with thick forest, except where it rises above the trees and sticks boldly out on top of some ridge or mountain crag. It rises in a steady ascent for 5 and 6 miles at a time, simply to run down into the next valley, which is valley only by comparison, because the lowest level is high above the sea. Almost all of the clay which originally surfaced the road has been washed away. For scores of miles the road is simply a trail of bed rock littered with loose stones. Every 200 feet there is an immense water bar. These were put on the road originally to turn the course of water from heavy rains into the gutter and thus prevent the washing away of the road. The road has not been long since washed away. The water bars now keep the rains from washing the loose stones off the jagged rock foundation of the old road.

In the valley towns, whose only excuse for being seems the mere habit of existence, are taverns whose halls once echoed the boisterous merry-making of stage-coach travelers; where the tavern keeper once poured bad wines down the dusty throats of thirsty stage drivers and postilions; at whose tables tired passengers once sat down to boiled dinners. Some of these taverns have obtained a new lease on life. The village loafer has been moved to the far corner of the bar to accommodate the begoggled motorist, down whose throat the tavern keeper now pours bad whisky. At the tavern table the modern knight of the road feasts on fried chicken, apple butter and other substan-

ROUNDING TOP OF LITTLE ROUND TOP AT GETTYSBURG

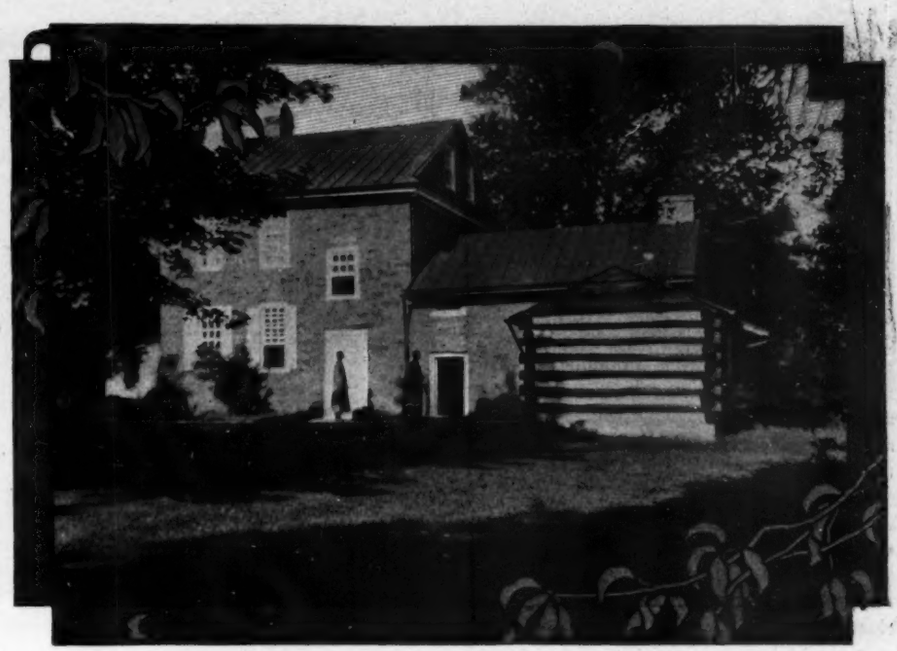
tials of a period before the Astors butted into the hotel business, but not so long ago as to have been forgotten when a Michigan-made stove transplanted the original fireplace.

There is "Old Joe" at McConnellsburg, whose memory far exceeds his age and who recounts more traditions of these everlasting, rocky hills than were ever set down in authentic history. He knows the man who invented the mighty brake with which the mountain wagons are held against perilous flight down the steep grades, and he thinks he knows the exact dialogue between George Washington and General Forbes when they discussed the surveying of the highway. He makes a specialty of motorists. More than 500 cars have passed through McConnellsburg this year. Joe has entertained nearly 300 parties, and expects to exceed that figure by the time cold weather drives motorists out of the region.

There had been no through trips from Pittsburg to Philadelphia and return until Mr. Waldon first attempted to drive a Packard over the road in 1 day. This summer he essayed to establish a record that would test the ability of the car in continued hard running over a mountain road, in whose entire 300 miles there is no chance for high speed running and on which a fast record must be made absolutely by steady plugging.

Mr. Waldon left Pittsburg at 4 o'clock in the morning, with a party of five in a standard touring car. The first half-century of the trip was made before dawn over that hilly, tortuous road leading to Bedford Springs, which is familiar to all of last year's Glidden tourists. From Bedford the course turns northeastward through the very heart of the mountains and then runs eastward through Chambersburg and Gettysburg to Lancaster, where it strikes the famous Lancaster pike leading into Philadelphia.

The foot hills of the Alleghenies begin immediately out of Pittsburg and the early morning ride was an unbroken struggle against grades and water bars. The brakes had to be used on both sides of each mountain. For mile after mile the car would be tossed from "thank-you-marm" to "thank-you-marm," until finally it reached the apparent top of some ridge, only to descend by an equally arduous road to the bottom of the valley, whence it would rise again through foot hills and finally onto the last long climb of the next mountain ridge.

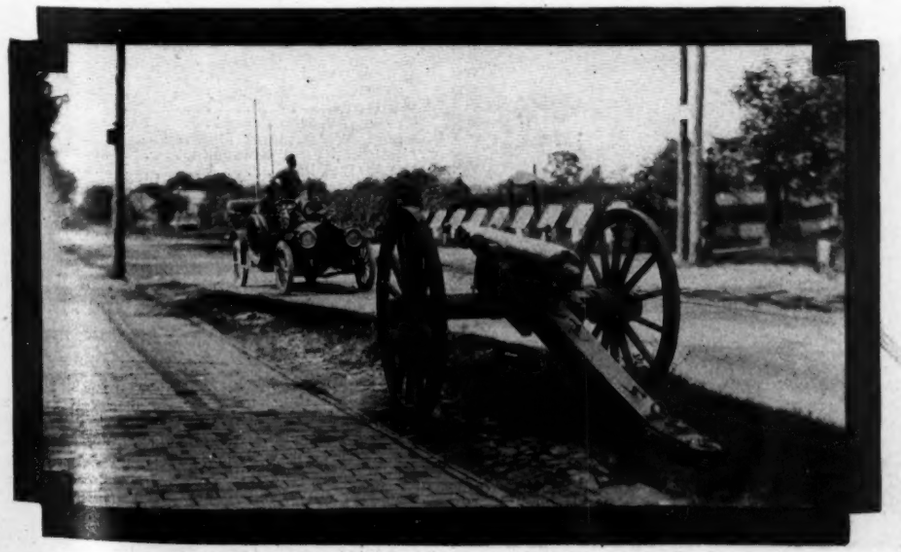


WASHINGTON'S HEADQUARTERS AT VALLEY FORGE

When daylight succeeded Prest-O-Lite, the view from each height showed in the hazy distance a long, blue bank, on whose crest an occasional break in the forest marked where the road 25 miles away touched the clouds. "Beating it" between crests meant simply a continual zigzagging from one side of the road to the other in order to strike the water bars obliquely and rise over them with undiminished speed, but with lessened jolt. Up hill and down hill, it was the same steady 25 to 30 miles an hour, the monotony of which was occasionally relieved by an extremely bad place, that might mean the putting on of brakes going up or the putting on of power going down. In one, two, three order the wheels slammed over the water bars, the car was yanked straight again and then pulled to the right of the road to take the next obstruction on the highway.

There is no let-up in these water bars. Two hundred feet apart, they are like rough ties in a giant rail-less railway between Philadelphia and Pittsburg. Even when the road swept down the eastern face of the last mountain ridge and into the rolling farmland of eastern Pennsylvania; even when the now leveler road became a comparatively smooth macadam —still the water bars remained to check the flight. Record breaking continued just a persistent struggle against stubborn obstruction. From 4 o'clock in the morning Mr. Waldon stopped only while an exploded tire had been repaired and at noon to feed the car with gasoline.

Occasionally a slanting pole across the road meant a toll-gate and a brief respite from the bouncing, tiring journey; occasionally a small village meant a brief respite from the unpopulated hills or from the wearisome quietude among the apathetic Pennsylvania farmers. Not until the refining influence of Philadelphia was approached, and the Lancaster pike had become a boulevard through beautiful suburban villages, was there a restful breath or an easing up of the tense attitude that had been taken to conquer the roughness of a highway which was built for stage coaches and seems to have a natural protest against its adoption by motor cars. Then the town marshal took the place of the water bars and stood with almost the same frequency on the road.



WHERE THE BATTLE OF GETTYSBURG WAS FOUGHT

MANY SEE GYMKHANA

C. A. Tilt in Diamond T Winner of Chicago Motor Club Event at Wheaton County Fair

Chicago, Aug. 28.—Fifteen thousand people witnessed the gymkhana run by the technical board of the Chicago Motor Club at the Wheaton county fair Wednesday and between 400 and 500 motor cars were lined up on the grounds, showing the interest this novel sort of sport aroused among the society folk, who are either engaged in the promotion of the fair or are patrons of it. Nineteen of the twenty-two cars entered participated in the contest and the winner turned up in C. A. Tilt, manufacturer of the Diamond T, who drove his roadster and made a creditable showing in each of the seven classes.

It might be explained that the Wheaton county fair is not of the usual sort. It is an annual event which is promoted by wealthy people who have their country homes in and around Wheaton, and it lasts a week. Wednesday was set aside as motor car day and the Chicago Motor Club asked to furnish the entertainment, which it did most successfully. There were two divisions, one for gasoline cars and the other for electrics. The latter failed to fill, however, Mrs. F. A. Babcock, Jr., in a Babcock electric, being the only participant. Mrs. Babcock, however, went through the various stunts and finished with credit to herself and the car.

The fun started with an "economy" test, which consisted in sending the cars over a series of bumps, each driver carrying a glassful of wine, the "economy" angle consisting in seeing how much wine remained in the glass after the test had been completed. Tilt did best in this. At first it was ruled that the cars take the bumps on the high, but after the Diamond T, Lozier and Pierce-Arrow had shown this was a trifle too strenuous the rule was changed and any gear was permissible. Next came the roulette. A huge revolving wheel with pegs on it was put up and each driver was given five rings to throw. The object was to ring as many pegs as possible. Here again Tilt surpassed.

The circus ring consisted of a suspended hoop through which the driver's cap had to be thrown and caught while the car was running on the high. Eleven of the contestants succeeded in doing this. The lancers was next, each driver being given a lance and compelled to wield it backhanded, spearing a series of rings. At this J. E. Plew in the White steamer did the best work, Vaughn in the Lozier being the only one to miss altogether. Then came the favors, a stunt which required each driver to stop his motor, jump out of the car, take off duster and cap, start his motor again, put on coat and cap, have a flower pinned on and start again, time being taken while this was being done. Plew again excelled here. He didn't have any motor to crank, but he had to go through the motions just the same.

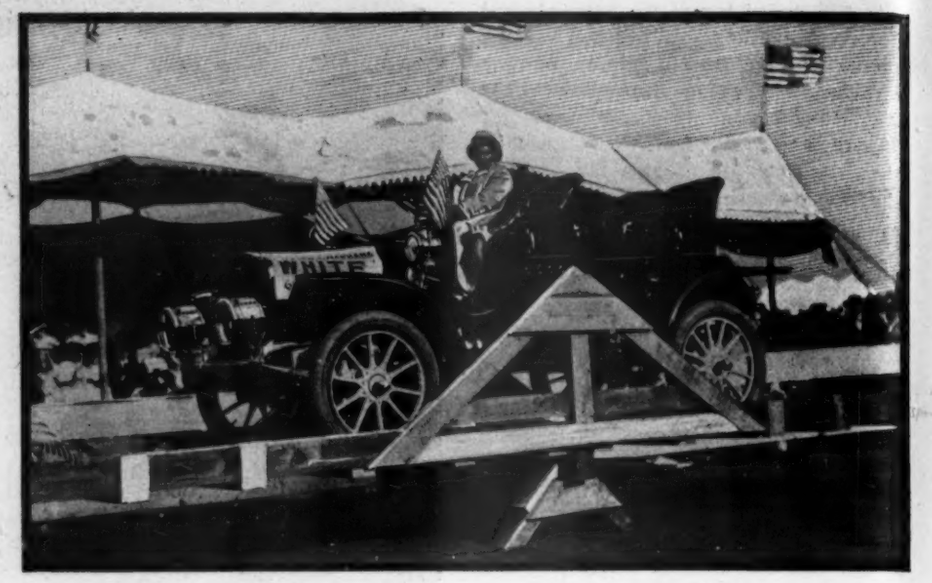
On the teter board seven of the cars succeeded in balancing as per the regulations, one of the successful drivers being Miss Mildred Plew in a White steamer. Her father also succeeded, as did the Pierce-Arrow, Cartercar, Winton and Crawford.

The affair wound up with the tea meeting. A series of posts had been erected. On the top of the first one was a box of cigarettes and the driver had to take one; then came a box of matches on the next post and one had to be taken out; lemons were next and on the fourth post was a glass of wine. The driver lifted this, and before he reached the next post took a sip and put the glass on the final platform. The final results of the gymkhana were as follows:

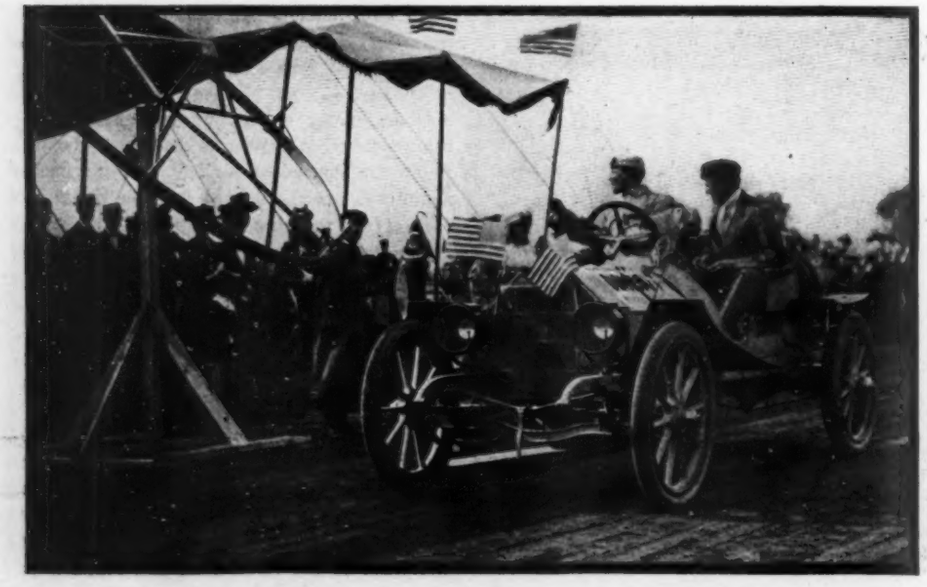
Car and driver—	Points
Diamond T, C. A. Tilt	50
White, J. E. Plew	34
Corbin, B. G. Sykes	29
Buick, F. H. Moran	29
Stoddard-Dayton, Walter Smith	25
Chalmers-Detroit, F. Vaughn	25
Winton, J. F. Davis	11
Moline, W. J. Boone	9
Crawford, J. H. Seek	— 9
White, Miss Plew	—11
Renault, Bruno Zobel	—11
Pierce-Arrow, Paul Hofmann	—22
Monarch, Paul Symonds	—27
Ford, J. Vlias	—31
Studebaker, B. C. Hamilton	—35
Lozier, F. C. Vaughn	—45
Cartercar, Ed Kahl	—58
Great Smith, M. B. Beeson	—73

Mrs. Babcock, in a Babcock electric, the only contestant in that division, finished with 5 minus, making a particularly good showing over the bumps and at the lancers. The crowd was particularly impressed with the driving of the two women, Mrs. Babcock and Miss Plew, and the applause was long and loud when Miss Plew gracefully balanced the big White steamer on the teter board, something at which twelve others failed.

The society folk were delighted with the success of this novel entertainment



Miss Mildred Plew, in White Steamer, Balancing on Teter Board



C. A. Tilt in a Diamond T, Gymkhana Winner, at Roulette Wheel

MRS. BABCOCK IN BABCOCK, WINNER OF ELECTRIC DIVISION IN WHEATON GYMKHANA

and the technical board of the Chicago Motor Club was thanked for its efforts. The Wheatonites appreciated the affair so much they took time by the forelock and asked that the motor club again handle motor car day next year, when the technical committee will attempt to stage something more elaborate.

DEATH CLAIMS LOUIS KISSEL

Milwaukee, Wis., Aug. 31—Louis Kissel, president of the Kissel Motor Car Co., of Hartford, Wis., is dead, the result of an assassin's bullet. Mr. Kissel was shot in his office on August 20 by John Gerbier, a Polish employe, who had fancied grievances and gave Mr. Kissel no opportunity to hear them. Mr. Kissel lingered between life and death in the Milwaukee hospital here until Friday, when life ebbed away. Septic peritonitis was the immediate cause of death. Mr. Kissel was born in Germany on August 14, 1838. He came to Washington county, Wis., at the age of 19. Thirty-five years ago, having gained a competence on his farm, he moved to Hartford, the county seat, and with his sons established the city's first important industry, the Hartford Plow Works. He founded the Hartford Lumber Co., the First National Bank of Hartford, the Northrup-Tenteal Fur Co., the Hartford Electric Co., the L. Kissel & Sons Co., manufacturers of implements and vehicles, and lastly, the Kissel Motor Car Co., which has come to be the most important and largest industry in east central portion of the state of Wisconsin.

ALCYON WINS A CUP

Paris, Aug. 15—Driving at the rate of nearly 55 miles an hour, Barriaux landed the two-cylinder Alcyon voiturette the winner of the coupe de Normandie race, which was run today at Caen. The distance covered was 154.2 miles and the winner's time was 2 hours 49 minutes 25 seconds. There were ten starters, of which seven had already competed in the voiturette grand prix, at Dieppe, last July. These seven cars were the Alcyon, two Werners, two Gregoires, a Guillemin and an Aries. The other three cars were also Aries machines. The race was open to the following classes of cars: One-cylinder cars weighing, empty, a maximum of 550 kilos; two-cylinder cars of similar weight and four-cylinder cars weighing not over 700 kilos, empty. The maximum bore for single cylinder cars set at 110 millimeters for the four-cycle engines and 85 millimeters for two-cycle engines. For the two-cylinder cars the maximum bore for four-cycle engine was set at 120 millimeters and at 90 millimeters for a two-cycle engine. For the four-cylinder cars the maximum bore allowed was 85 millimeters; for a four-cycle engine and 60 millimeters for a two-cycle engine. The cars had to be equipped with their regular every day touring body outfit and were furthermore subject to sale after the race at the price given in the catalogs.

NINE IN LOWELL RACE

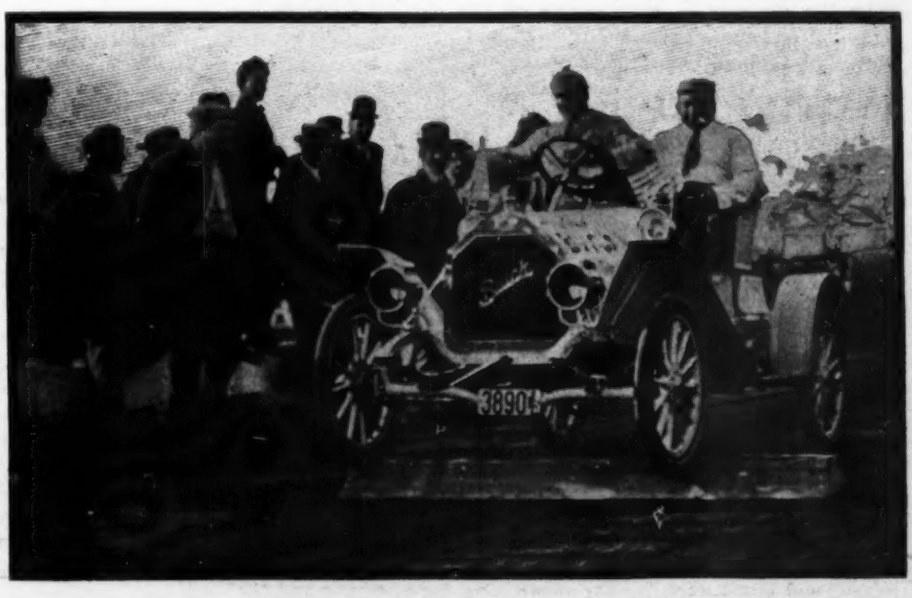
Massachusetts' Big Labor Day Road Event Attracts Crack Lot of Drivers and Cars

Lowell, Mass., Sept. 1—Everything is now in readiness for the big road race to be held here next Monday. There were so many difficulties to be overcome that at one time it seemed as if the entries would not be very large, but by hard work on the part of President J. O. Heinze, Vice-President Frank S. Corlew and Secretary J. C. McKenna, of the Lowell A. C., everything was arranged satisfactorily.

There are now nine cars entered and they will be driven by men well known in racing history. Strang will be here driving an Isotta; Poole will have another of the same sort. George Robertson, who drove an Apperson, has been secured to pilot a Fiat, and Frank Lescault the Simplex. Two Knox cars are entered, one to be driven by Al Denison and the other by William Bourque. There are also two Buicks with R. Burman and C. S. Smith as drivers.

The entire course has been wired and with a large detail of policemen, supplemented by members of the militia in plain clothes, sworn in as deputies, there will be ample protection. The mayor of Lowell has been considering the plan of calling out the militia in uniform, and if it is necessary this will be done. The race will start at 10 o'clock, and as the circuit is but 10 miles long the cars will go around twenty-four times. A large grandstand is in course of construction, and this will be divided into three sections. Telephone wires have been placed about the course, and there are nine stations from which news will be sent to the grandstand.

The race has aroused a great deal of interest throughout New England and, coming on a holiday, it means an enormous crowd such as Lowell never before has had.



FRED MORAN IN BUICK, TAKING THE BUMPS AT WHEATON

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MOTOR AGE

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Avoid the Smoke Cloud

IF POLICE OFFICIALS would busy themselves with the elimination of the smoky exhaust and leave the speed trap to itself for a time they would be working a great benefit to the industry. The smoke nuisance while disappearing in many makes of cars is not improving at all in others. In some cases the clouds of bluish black smoke owe their presence to faulty lubrication systems on the car motors and in others to the overzealousness of the driver to be sure of ample lubrication.

Enough Better than Too Much

THAT "enough is as good as a feast" is not only true in connection with the lubrication of a motor car but it can be elaborated upon to the extent that "enough is better than a feast" for that car that's motor gets the proper quantity of oil at the proper time and in the proper place is better lubricated than that which is given an overabundance, a large amount of which is burned into carbon in the cylinders where it afterward goes to induce pre-ignition and impede the normal working of the pistons. For a time many motorists thought that certain makes of cars could not run without the smoke cloud as a tail-piece, but that day is over. A casual halt on a motor-used avenue will show a car of one make passing by without the smoke and another with the rear of the car wrapped in it. If the lubricating system of a car is not capable of maintaining the necessary oil level within the crankcase for the splash then the system is deficient.

European Laws Severe

IN EUROPEAN systems motorists are arrested because of the smoke cloud and so thorough is the enforcement of the smoke ordinance in London and Paris that certain car makers were compelled to abandon their lubricating systems and adopt others because of the ordinance, and the impossibility of using certain systems and eliminating smoke. Viewed in this light these ordinances have been a direct value to the motor car industry. American cities have been slow to introduce and enforce such ordinances, but their attention is being directed to such, and when the drafting of such comes up the motorists should be consulted and those same motorists should give every assistance in the passage and enforcement of the ordinance.

Avenues Made Smoke Trails

FREQUENTLY on a bright morning Michigan avenue, Chicago, is smoky for blocks because of burning oil in cars, and coupled with this is the odor of burned gasoline caused by poor carburation and fuel control. Both are needless offenses against the public, both are working against the welfare of motoring and both can be corrected by a little care on the part of makers and operators. If the matter is taken up by builders and drivers the enactment of prohibitive legislation will be forestalled, but if not then councils will pass, perhaps overdrastic by-laws, and the motorists will suffer unduly. A stitch in time along this line will save nine, and moderate action is counseled. The motorist who speeds his motor while the car stands idle at the curb and fills the air and almost hides the car in a cloud of smoke is an offender deserving of punishment as is the driver who indulges in needless cutting out of the muffler and speeding the engine with the simple aim of attracting attention and thinking others look upon him as a hero because that is how he views himself. Such grand stand work is poor advertising for motoring and the motorist in any place.

Reduction in Tire Prices

MOTORISTS must take off their hats and courtesy low to the united, deliberate 15 per cent reduction in prices that the majority of the big tire makers have announced to take place after September 1. Car owners are almost compelled to pause in their jubilations and wonder at the unanimity of the big rival rubber companies when it comes to such a considerate use of the ax at so crucial a period of the year. The tire makers are to be congratulated on the majesty and solemnity of the action, which savors not of the cut slash methods of war that so frequently characterize drop in prices, in which bulls and bears are arrayed in deadly action. In short they have met an exigency gracefully—with apparently the utmost composure, and certainly with the highest dignity. Although the announcements come from the different factories at different times, yet all have been given out with the air of completeness and premeditation that the entire motor car industry feels the reduced prices are to stay, that the companies making the reductions have only made them after a careful survey of the entire situation, and the uniform reduction and selection of September 1 as the date impresses the motorists with the concerted action of the rubber community.

The Unanimity Attracts

Everybody enjoys organization, united action, and co-operation. The army on the march that evidences discipline in the execution of each and every maneuver excites more admiration than the disorganized mob; the ocean squadron sailing in line or in column is more an object of interest and study than the helter-skelter fishing smacks scattered over the ocean sand bar; and the concerted and uniform price reduction in tires at this time impresses the car manufacturers and car users with the status of the rubber industry than had the reduction come in the form of a 10 per cent cut at Akron, followed by a 15 per cent slicing at Indianapolis, and the latter rapidly succeeded by a 17 per cent reduction in Detroit and a 20 per cent break in Hartford.

Several Causes For It

EVERY effect has its cause and the reduction cause, so the rubber men say, is due to the price-cutting that certain middle-men or dealers have been doing as well as to the many local tire companies that have arisen in the medium-sized and large cities. The dealers have been working their game for months and have made it most inconvenient for branch houses in many cities. The local tire companies, many of them in the field now for 2 or 5 years, have worked havoc with the repair business, both of which conditions have had a moral influence in the status of the entire rubber industry. Added to these conditions is the general feeling throughout the country that with the big reduction in certain lines of cars a commensurate reduction in the tires was imperative. The coming of the $800 four-cylinder runabout, the $1,200 five-passenger touring car and the $2,000 medium-powered five and seven-passenger car have all had their influence, directly or indirectly, in influencing the 15 per cent cut. Added to these conditions is the general impression that has existed throughout the country for several years that tire upkeep is too expensive and out of all proportion with the car proper. This condition has kept many people from buying cars, and coming as the reduction does at the beginning of a season that promises to be a record-breaker in the motor car industry, it should lend impetus to the sale of cars during the next 12 months, and act as a strong force in increasing the sale of cars and thereby returning in this channel by means of increased sales what the rubber makers are losing in profit.

CURRENT COMMENT

ANOTHER false rumor, obviously originating because of the "war" over the control of racing in this country, has been exploded by the indignant denial of the Automobile Club of Kansas City that it has withdrawn from the American Automobile Association. Furthermore, to prove this assertion the Missourians have decided to run their big reliability event under the sanction of the national organization. Of course those responsible for the original story may have something upon which to base the yarn—upon the fact that there is some inside squabbling going on in the ranks of the Missouri state association; but as President Hotchkiss points out, it does not necessarily follow that because a club withdraws from a state association that it also quits the American Automobile Association. It is possible for a club to be an A. A. A. member without belonging to one of its state branches, so the Kansas City "resignation" story seems left without a leg upon which to stand.

SPEED traps apparently are becoming more and more numerous throughout the land, and the clubs are just beginning to awaken to the necessity of putting a stop to these pernicious practices. Some of the more hustling organizations are giving their members something for their money by sending out warnings, as, for example, the Pittsburg club, which this week tells motorists to beware of a speed trap at Brockton on the Pittsburg-Erie route. It is work of this sort that illustrates the benefits to be derived from organized motoring, and it is to be regretted that there are not more like the Pittsburgers. This art of extracting money from the motorists by means of traps has been reduced to a science in some quarters, and one of the greatest sufferers in this respect is Chicago, where the latest is a mail-order business originated in one of its suburbs. The trap is worked by means of a 2-cent postage stamp. A motorist passes through a trap and his time and number are taken by some one—presumably officials of the law. Then the justice takes his pen in hand and writes the unfortunate that he has violated the speed law, but if he will send a cash bond he will be recorded as pleading guilty and the check used to balance the account, thus saving the motorist the trouble of appearing in court and having his case heard in public.

"MISTER, TOOT YOUR HORN!"

UNFORTUNATELY for the good of the sport, the "ringer" car is becoming very prominent in hill-climbs and reliability runs, and if the practice is not stopped soon the public will become suspicious of all corts of competitions. The "ringer" car may have all the ear-marks of a stock rig; its cylinders may be regulation size; and even the expert may be fooled by it; but it is not stock. It has undergone certain refinements and practically has been hand-made. It is a better hill-climber than its stock brother and because of this it often is able to beat selling at a much higher price. The use of the "ringer" car is just the same as shoving a revolver under the nose of an unarmed citizen and compelling him to empty his pockets; it means that the maker is robbing his rivals of their reputations by unfair methods, and it behooves the American Automobile Association, when it detects one of these "ringers," to mete out more severe punishment than it has in the past. A detected maker should not simply be disqualified from the one event; he should be barred from all competitions run under A. A. A. sanction.

THOSE who have insisted that to interest the common people in motoring it is necessary to run thrilling track races might have changed their minds had they been at the Wheaton county fair, near Chicago, on motor car day, when 15,000 people sat 2 hours and watched a gymkhana with fully as much interest as they would have looked at high-powered cars circle a horse track at a dangerous clip. The Wheaton event seemed to show that the people like to be amused as well as thrilled; that if they can spend an afternoon in the open air, forgetting business cares, they would as lief watch a gymkhana as they would a race.

MOTORING EVENTS SCHEDULED FOR DECISION IN THIS AND OTHER COUNTRIES

Voiturette Race—Voiturette contest promoted by French L'Auto, September 1-8.

Coast Reliability—San Francisco-Los Angeles reliability run, September 5-9.

Speed Trials—Automobile Club of Bologne's Speed trials, September 6.

Commercial Trials—Automobile Club of Italy's heavy vehicle competition, September 6.

Florio Cup Race—Annual Florio cup race, Bologne, Italy, September 6.

Lowell Road Race—Labor day road race of Lowell Automobile Club, at Lowell, Mass., September 7.

Denver Race—Denver Motor Club's 300-mile endurance race, September 7.

Wildwood Races—Labor day straightaway races at Wildwood, N. J., September 7.

Cleveland Reliability—Three-day reliability run of Cleveland Automobile Club, October 7-9.

Springfield Hill-Climb—Hill-climb of Springfield Automobile Club on Wilbraham hill, at Springfield, Mass., September 11.

New York Test—Combined road test and pleasure run of New York Automobile Trade Association, September 16-17.

Southwestern Reliability—Eight-day reliability run of Automobile Club of Kansas City, September 19-26.

Austria's Big Climb—Automobile Club of Austria's annual Semmering hill-climb, September 20.

Massachusetts Test—Bay State Automobile Association's 24-hour endurance run, September 23-24.

Four-Inch Race—"Four-inch race" for Tourists' trophy, on Isle of Man, September 24.

Thousand-Mile Reliability—Chicago Motor Club's 1,000-mile reliability run, postponed from June, October 6-9.

Vanderbilt Trial—Eliminating trial to select American team for Vanderbilt cup race, October 10.

Road Congress—First international road congress and exhibition in Paris, October 11.

Vanderbilt Cup Race—Vanderbilt cup race on Long Island motor parkway, October 24.

Light Car Race—Automobile Club of America's light car race at Savannah, Ga., November 25.

Grand Prize Race—Automobile Club of America's grand prize race at Savannah, Ga., November 26.

Paris Salon—Annual French motor car show, November 28-December 18.

Palace Show—Annual show of American Motor Car Manufacturers' Association in Grand Central palace, New York, December 31-January 7.

Garden Show—Ninth annual show of Association of Licensed Automobile Manufacturers, Madison Square garden, New York, January 16-23.

Chicago Show—Annual N. A. A. M. show in Chicago, February 6-13.

CONSUMER PROFITS BY TIRE PRICE REDUCTION

CHICAGO, Sept. 1.—As anticipated today saw a general revision of list prices on motor car tires by the leading makers. Some of them have not as yet made their formal announcements, but those that haven't declare they will have their statements ready inside of a week. However, the Fisk, Diamond, Morgan & Wright, Michelin and Goodrich came out with their announcements today, while the G & J, Goodyear and Firestone have their lists about ready to give out.

Without going into details, it is evident that there has been a general reduction all along the line which will average up at about 15 per cent. The users of big tires will profit more by the reduction than anyone else, in some cases the reduction on tires of 36-inch sizes amounting to 25 per cent.

The B. F. Goodrich Co. states that its prices for 1909 show a reduction to the consumer of from 20 to 30 per cent, while to the dealer it will average in the neighborhood of 15 per cent. A most important departure with the Goodrich company is in making the price of its quick detachable tire the same as the regular clincher. With this change all types of its tires are the same price, with the exception of the Bailey tread and the Palmer-Webb fabric. The Goodrich company lays particular stress upon the fact that its reduction in price must not be looked upon as a change in the quality of its tires. Its product for 1909 will be the same as that which has gained for it its reputation during the past season. All tires will be made with its white tread stock.

"With the reduction in the cost of crude materials and increased as well as improved facilities for turning out a large volume, we are able to coöperate with the motor car manufacturers in reducing the cost of motoring," said Manager Rowan of the Chicago branch. "On account of our inability to turn out enough tires to handle the business that came to us during the past season, we are erecting new buildings that will be devoted exclusively to the manufacture of our motor car tires. We anticipate these buildings will be ready for running order by November 1. This will double our present output, we figure. There will be only three prices quoted hereafter—to the manufacturer, dealer and jobber, and consumer. The jobber now is on the same plane as the dealers, and we will do everything possible to encourage the dealer. Our new prices to the consumer show a big reduction. A 36 by 5 that used to sell at $74.43 now is $56.95. An inner tube of this size used to cost $15.93; now it is $10.66. A 30 by 3½ used to sell at $31.55; now it is $22.20, with the inner tube selling at $5.05, as against $7.43 last season."

The Fisk company held its session in Chicago last week, which was attended by all the branch managers, at which time the situation was discussed and the new prices read, all of which met with the approval of the tire men present. Following this meeting B. H. Pratt, of the company, had the following to say:

"This revision of prices means that the tire business is down to a hard pan basis. It means that the tire manufacturers will have to do twice as much business to make the same profit as they did in the year just ending. But we are not complaining, for the outlook justifies us in revising the lists. The new list means that the percentage between the tire companies and the dealers and makers will be cut down and that the users of tires will be the ones to profit most. It also means that the price-cutters will be frozen out and that the trade will be thrown into legitimate channels, that is, the dealers and garage peopie will get the business. The reductions range from 14 to 20 per cent, as for instance, in the bolted tires made by us there is a 20 per cent reduction in the 36 by 5-inch size. Where it used to list at $92, the new figure is $73.75. With a 34 by 4 there is a 16 per cent reduction, the old price being $56 and the new one $47. There is a 19 per cent reduction in the 30 by 3½ size, the old price being $44.50 and the new one $36. In clinchers the figures run about the same. I also wish to state there will be no change in quality or rubber in the 1909 Fisks.

"This new list was brought about by the tire and car makers and was caused by the price-cutting of the dealers. It means a great deal to the car makers, for the new list will greatly reduce the upkeep."

Morgan & Wright are in line with the other big concerns and G. S. Shugart of the Chicago branch declares the revised prices will not vary more than 10 cents either way with the Diamond or Goodrich. "The consumer is the one who will profit most by the reduction," he said, "and I look upon this move as one of the greatest boons motoring ever had. The dealers who have cut prices are responsible for the actions of the tire concerns. Formerly we allowed them about 20 per cent, but they were not wise enough to take advantage of this, some of them often cutting prices so they got little or no profit out of their tire sales. From now on, however, they will have to hold up prices, for they have only 10 per cent on which to work. In making their revision Morgan & Wright have decided to list Dunlops and quick detachables at the same figures as clinchers, which will favor users of those types who heretofore have had to pay more than for the clinchers. As an example of our new prices, I will state that a 36 by 5-inch tire that formerly sold for $74.43 now lists to the consumer at $56.95. An inner tube of this size that formerly sold at $15.93 now can be had for $10.60. Take a 30 by 3½, which is a popular size. That formerly listed at $31.55 to the consumer; now we sell it at $22.20. For the inner tube we ask $5.05, where we used to get $7.43."

"Since the new prices were announced we can notice a big jump in our sales to the consumer," said C. C. Harbridge, manager of the Michelin branch. "Our salesroom is packed today, and I look upon the move as a great thing for the owner. It will keep in line many who have complained of the cost of upkeep, and eventually the companies will lose nothing by the reductions. I should figure that our prices to the consumer will run from 15 to 20 per cent lower than the old ones. We have not reduced the prices of Dunlaps and quick detachables to the same level as clinchers, but there is very little difference. Under the new rule a quick detachable of 30 by 3½ size sells at $29.92 as against $27.20 for the clincher. A 36 by 5-inch tire that formerly listed at $84.25 now can be had for $62.45, with the inner tube at $15.74, as against the old price of $21.25. A 30 by 3½ used to sell at $36.70; now it is $27.20, with the inner tube costing $6.66 as against $8.98."

"The G & J prices are not ready to announce yet," declared F. S. Cropley, of that concern's Chicago branch. "We are going to have a new list, though, and as is the case with the others it will average about 15 per cent reduction. The consumer is going to be the one to profit

PREMIER CENTURY CAR REACHES HOME AFTER LONG TRIP

most by the changes and the dealers' profit is going to be cut about 10 per cent by all the rubber concerns. There also will be a general stiffening as regards replacements and the tire business is going to be on a solid basis hereafter. Formerly we tried to force the trade to the dealer and now the user is going to be the one catered to. This revision of prices was brought about by the small dealers, who have cut and slashed unmercifully. I know of many cases where a small dealer has sold tires for just what he paid just so a rival should not get the business. This has demoralized the tire trade and we intend to stop it."

In making its announcement of price reduction of an average of 15 per cent, the Diamond company says the feature of its action is the placing of the quick detachable type on the same price basis as the regular clinchers for one-piece rims. In a statement issued from the factory at Akron, the company says: "The standardization of tires has made rapid proggress and in time to come will go still further. Quality and price will both be factors in the public's ultimate selection of the strictly standard tire. As to price, we are able to join with the motor car manufacturers in reducing the cost of motoring by reason of our increased output, the present season's elimination of faulty merchandising practices in the motor car business as a whole, and because we have been able to cut out almost entirely the expenses chargeable to defects in manufacture. Another consideration helping to give users a better price, is the practical standardization of tire sizes. Our equipment can now be economically regulated and maintained. In more ways than simply the lower prices, also, is the car owner to have a larger money's worth in tire service. The improvements we have accomplished notably increase the mileage tires will give, and reduce tire repair bills at the same time. This is largely because the tread will have greater life than formerly. The correct economic principle is that the tread of a tire should wear so long that, barring accidents, only the aging and natural deterioration of the body will cause the casing finally to give way. It is along this line that our betterments show themselves. These, together with our success in so distributing the strain of shocks a tire is likely to receive, as to make fabric rupture and consequent blowouts a very infrequent occurrence, will, we consider, be very prominent in the public's tire discussions during the next several months."

The Continental and Ajax people are not yet ready to talk new prices. Manager J. B. Burwell of the Ajax branch says he will have new figures to quote but cannot talk until next week. The Continental statement is not ready. At the Hartford branch it was stated the new prices will be discussed at a meeting to be held at the factory September 15.

COMET IS A NEW STAR

California-Made Car Captures the Majority of Events at the Track Meet at Santa Rosa

San Francisco, Cal., Aug. 25—A 2-day race meet held on Saturday and Sunday at Santa Rosa under the auspices of the Sonoma County Automobile Club proved to be one of the most successful affairs in California during the present year. A number of fast cars were entered and remarkably good time was made. The Santa Rosa oval has the reputation of being the fastest horse track in the state, although it is reported to be a little short of 1 mile.

The races developed a peculiar situation never before met here. Seven of the ten motor races were captured by a little California-made car, the Comet. From two of the other races the Comet was barred. Only in one race, the 25-mile free-for-all, did the Comet fail, and then its trouble was due to the bursting of a tire, which put it out of the running for several minutes. When it resumed it reeled off many miles close to the minute mark, and two that were caught at :58, breaking the Pacific coast record. It passed all the other cars, even the powerful Stearns, at will. In the races where it had only small competitors it merely played with them. One lap it would allow the other cars to pass it, and in the next it would shoot by them in front of the grandstand.

The interesting question now is as to the proper classification of the Comet. So far as known there is but the one car in existence. The motor is one designed by Al Hall, who was one of the drivers of Fernando Nelson's Columbia car when that machine made its record run between San Francisco and Los Angeles 2 years ago. He also is known as a clever motor designer. The motor has been put into a body that is a mere miniature, a veritable toy.

The other winners were the Stoddard-Dayton and the Stearns. Summary:

FIRST DAY

Ten miles motor cycle—Won by A. Cheilni on a Thor; second, E. Karslake on a Curtiss. Time, 10:45 2-5.

Five miles, $1,500 or under—Comet, Frank Free, won, time 6:53; Buick, Frank Murray, second, time 6:55. Lambert, Maxwell and Auburn scratched.

Ten miles, $2,500 list or under—Comet, Free, won, time 11:07 4-5; Stoddard-Dayton, Wiseman, second, time 11:16; Buick, Murray, third, time 11:32 4-5. Maxwell withdrew.

Five miles, novelty race—Comet, Free, won.

Ten miles, over $2,500 — Stoddard-Dayton, Wiseman, won, time 12:44 1-5; White, Fred Dundee, second, time 13:13 3-5; Peerless, Free, third, time 13:36 4-5.

Fifteen miles, free for all—Comet, Free, won, time 16:04; Stoddard-Dayton, Wiseman, second; Autocar, Case, third.

SECOND DAY

Ten miles, $1,500 or under—Comet won, time 11:05; Buick second, time 11:08. Lambert distanced.

Five miles, $2,500 or under—Comet won, time 5:41; Buick second, time 5:44.

One mile novelty, engines dead, operators 100 yards in rear, run to and start engines, stop on starting line, operators run 100 yards ahead—Comet won, time 1:55; Autocar second, time 2:12; Buick third, time 2:02 1-5.

Ten miles, $2,500 list—Stearns won, time 11:04; White second; Peerless third.

Twenty-five miles, free for all—Stoddard-Dayton won; five other cars did not finish. Time, 29:54. The Comet broke its record, a mile in :59, with a mile in :58 in this race.

GREET PREMIER CENTURY CAR

Indianapolis, Ind., Sept. 1—The Premier century car was the recipient of a rousing welcome when it reached the vicinity of Indianapolis after its successful trip through and from the east. The Premier company stood treat to a large party of local and out-of-town motorists at a chicken dinner last Friday, it being arranged in honor of the occasion and Joseph Moore, who has driven the car since July 15. The Premier Glidden tour cars carried the guests to Greenfield, about 25 miles east of this city, where they awaited Moore's appearance. Moore had not been apprised of the affair and was of course greatly surprised when he was hailed and told to stop at the farm house where dinner was served. He was the guest of honor and was kept busy telling of his varied experiences on his trip through the east and on his way home, which route was via Baltimore, Hagerstown, Bedford Springs, Pittsburg and Columbus, the Glidden route of 1907. A thorough examination of the engine in the century car was made by every one present. Moore took oath he had not replaced a single part of its equipment and that the only care it was given was to see that it was filled up with gasoline, oil and water before starting a century every day. The car passed the 10,000-mile mark on the eighty-sixth day and will finish its work September 8, probably at Chicago.

STODDARD-DAYTON ON TURN IN RACE RUN AT SANTA ROSA

ONE WINNER IN CLIMB

Pope-Hartford Captures Journal Trophy, Chief Prize in Minneapolis Club's Contest

Minneapolis, Minn., Aug. 30—One distinct winner was evolved yesterday in the annual hill-climb of the Minneapolis Automobile Club, which is something unique in the annals of this style of motor competition, and which at the same time will prevent many from making claims not borne out by facts. In doing this the Gophers used the Chicago Motor Club formula which brings out motor efficiency, the handicap being based on piston area multiplied by time and divided by the weight of the car. Using this formula, the officials of the contest formally awarded the chief prize in the test, the Minneapolis Journal $1,000 trophy, to H. J. Clark, an amateur driver, whose 27.2-horsepower Pope-Hartford showed best under the formula, its percentage figures of 3.53 being the lowest of the fifteen cars that competed in the handicap events. Clark had two tries, his other percentage being 3.47, which, however, was not given consideration by the judges in making the cup award. Second honors under the formula went to the 32.4-horsepower Corbin, with 4.21, which also carried off the time honors in the gasoline division, with its :33 2-5. Third under the formula was a 22-horsepower Buick with 4:30. As figured under the formula the cars were rated as follows:

Car and driver	H. P.	Pct.
Pope-Hartford, H. J. Clark	27.2	3.53
Corbin, Gordon Bird	32.4	4.21
Buick, C. Nyquist	22	4.30
Buick, D. W. Onan	22	4.52
Overland, B. Fawkes	19.6	4.60
Stoddard-Dayton, A. C. Miller	36.1	4.73
Rambler, E. Sampson	32.4	4.90
Jackson, W. G. Benz	22	4.95
Ford, G. Dorr	22.5	5.09
Ford, W. E. Wheeler	22.5	5.18
Pierce-Arrow, P. Hofmann	60	5.50
Overland, L. Bousfield	19.6	5.84
Holsman, W. C. Rader	12.4	6.547
Schacht, H. B. Allen	14	6.599
Rambler, J. B. Lee, Jr	20	7.44

Eight classes were provided for and in these there were twenty-four contestants. Four of them were handicap events and the others were decided on straight time, the results being as follows:

CLASS A, MOTOR BUGGIES, HANDICAP

Car and driver	Time	Pct.
Holsman, W. C. Rader	:72	6.547
Schacht, H. B. Allen	:80 2-5	6.599

CLASS B, HANDICAP

Buick, C. Nyquist	:44 2-5	4.30
Buick, D. W. Onan	:46	4.52
Overland, B. Fawkes	:50	4.60
Jackson, W. G. Benz	:51 3-5	4.95
Ford, G. Dorr	:47	5.09
Ford, W. E. Wheeler	:49 4-5	5.18
Rambler, J. B. Lee, Jr	:78 4-5	7.44

CLASS C, HANDICAP

Pope-Hartford, H. J. Clark	:43-4-5	3.53
Corbin, G. Bird	:33 2-5	4.21
Rambler, E. Simpson	:45 4-5	4.90

CLASS D, HANDICAP

Stoddard-Dayton, A. C. Miller	:35	4.73

CLASS E, HANDICAP

Pierce-Arrow, P. Hofmann	:37	5.50

CLASS F, FREE-FOR-ALL

Car and driver	Time
Pierce-Arrow, P. Hofmann	:38 3-5

CLASS G, FREE-FOR-ALL

Corbin, G. Bird	:33 2-5
Stoddard-Dayton, A. C. Miller	:35

NATURE'S GRAND STAND AT MINNEAPOLIS HILL-CLIMB

CLASS H, HANDICAP

Car and driver	Time	Pct.
Pope-Hartford, H. J. Clark	:43	3.47
Overland, L. Bousfield	:64	5.84

CLASS I, FREE-FOR-ALL

Car and driver	Time
Moon, G. H. Seeley	:47
Rambler, J. B. Lee, Jr	:81 4-5

STEAMERS

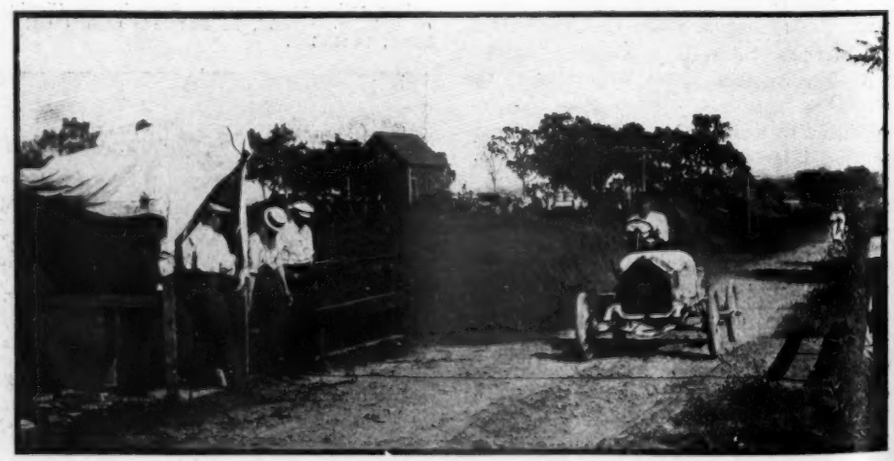
Stanley, G. B. Webster	:30 4-5
Stanley, C. G. Sigwald	:39 3-5

Cedar avenue hill, selected for the climb, is one of the hardest grades the Minneapolis club ever has attempted in a contest. Although run for the Journal trophy, the climb was under the auspices of the Minneapolis Automobile Club. The course was 2,136 feet long and 8 per cent grade.

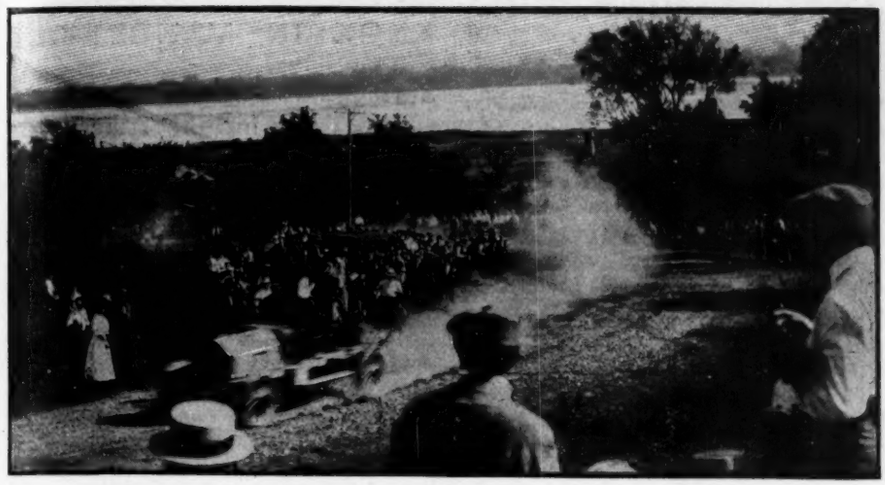
ATTRACTS "ONE-LUNGERS"

Paris, Aug. 26.—There are prospects of good sport at the voiturette race to be held near Compiègne, September 10 to 13, the present entries standing at thirteen. Practically all the cars taking part in the Compiègne event ran in the voiturette grand prix at Dieppe. There are changes for the Werner team, the chief of which is now A. Autran, who was pilot with St. Chaffray on the de Dion New York-Paris car. The task that the "one-lungers" of 3.9 inches bore will have to accomplish is to race round a closed and somewhat hilly course for a total distance of rather more than 300 miles, all attentions to the car

MINNEAPOLIS JOURNAL TROPHY



BREAKING TAPE AT START OF MINNEAPOLIS CLIMB



PAUL HOFMANN IN PIERCE-ARROW AT MINNEAPOLIS

BRONZE OFFERED IN CLASS F

after the start has been given being confined to driver and mechanic. Regulations differ slightly from those of the voiturette grand prix in the bore limits allowed to two, three and four-cylinder engines, these having been carried to 80, 70 and 65 millimeters for each class.

ARMY WILL TEST TRACTORS

London, Aug. 21—Being in the market for motor tractors capable of handling 8-ton loads, the British army authorities announce a competition for February next. The vehicle winning the competition will be bought at the conclusion of the trial at the price stated on entry blank, providing the experts consider it suitable for army work; the authorities also promise provisionally to buy other vehicles if satisfactory. Full liberty is given in the class of engine and fuel used, but price of the tractor must not exceed $5,000. Economy in fuel consumption is essential, and liquid having a flash point of less than 75 degrees Fahrenheit will be barred. Kerosene may be used for starting, providing the engine can be started from cold in less than 20 minutes. Points on which the awards will be made are, among others, distance and average speed at which 8-ton loads can be hauled without replenishments; cost and efficiency; hill-climbing power and ability to work away from highways.

CORBIN TAKING CURVE ON CEDAR HILL AT MINNEAPOLIS

BIG RALLY AT RACINE

Mitchell Agents, 125 of Them, Attend Annual Meeting of Company and Enjoy Themselves

Racine, Wis., Aug. 31—Concluding one of the most novel 3-day conclaves of agents that ever assembled at a motor factory in an annual business-pleasure meeting on last Saturday evening, 125 men who dispose of the Racine-made cars left for their homes, which are in thirty-four states and far-off Alaska, Porto Rico and the City of Mexico, bound in honor to dispose of more than $4,000,000 worth of 1909 Mitchell cars—the estimated output of the big works. Testifying alike to the confidence of both maker and agent as well as dealing the pessimists a hard jolt, the gathering that insures whirring lathes and busy machinery at the fire-proof works and steady work for an army of more than 2,700 employes, the number of allotments made and contracts entered into set a mark in manufacturing that is rated as little short of an epoch in the enterprising Badger state city by the most influential men of the Racine Business Men's Outing Club.

President William Mitchell Lewis, of the Mitchell Motor Car Co., Sales Manager James W. Gilson, Secretary G. V. Rogers, Designer John Bate and James Cram, who acted as hosts for the annual "family gathering," provided a 3-day melange for the men who sell cars that began Thursday, with an inspection of the enlarged plant and soon changed to a series of luncheons and dinners at the Racine Golf Club, with a special performance at a local theater monopolized for the evening by the Mitchell company for its guests. Practically all of the allotments for 1909 were made the morning of the first day.

On the second day of the convention more Mitchell touring cars were placed at the disposal of the small army and after a trip of inspection to the big malted milk factory the agents were again taken to the golf course to "prepare for the banquet." At the latter there were numerous wrestling and vaudeville side lights, the chief legend on the transparencies being "No speeches." Rules, however, were thrown to the wind when President Lewis' father appeared and was induced to speak about the wonderful growth of the motor car interests. Beaming optimism and thanking his auditors for their courtesy in listening to his collection of "dry financial facts with a golden commercial lining," the speaker drove home in the minds of all the host of agents the significant fact that the Mitchell company annually had doubled its output. He had some "inside tips" about the probable 1910 product of Designer Bate's workroom and predicted that at that time the Mitchell company would be the largest manufacturing plant in the middle west devoted exclusively to the production of motor cars.

NEW STUNT IN GOTHAM

Dealers Will Hold Combined Road Test and Pleasure Run on Long Island This Month

New York, Sept. 1—By way of demonstrating the running qualities and mechanical efficiency of fully equipped stock cars of the various models that may be entered, the New York Automobile Trade Association is to promote on Wednesday and Thursday, September 16 and 17, a combined road test and pleasure run around Long Island. Roughly estimated, the 2 days' tour will cover some 275 miles. The first day the course will be along the south shore of the island, with a noonday clam bake at Blue Point and a mammoth ox roast at Montauk Point, the night stop. On the return trip the caravan will cross to the north shore from Good Ground and stop for luncheon at Riverhead. There will be a liberal time schedule and time limit, since it is planned only to demonstrate the cars under normal conditions. The cars will be divided into six price classes with an added class for taxicabs carrying two passengers and a driver. The classification will be: Class A, $850 or less; class B, $851 to $1,250; class C, $1,251 to $2,000; class D, $2,001 to $3,000; class E, $3,001 to $4,000; and class F, $4,000 and over. The taxicabs will be grouped under class G. The classes will be further subdivided according to passenger-carrying and load capacity.

The rules of the test are simple and brief. Motor cycle observer couriers will act as monitors and report infractions of the conditions, which in part follow:

The run is limited strictly to stock cars of any year's model, which must be fully equipped with bodies and seats, such as are shown in maker's catalog; temporary rough board and soap box seats will not be allowed in the run, the idea being to show the public the finished cars. Extra tires may be carried, but no extra parts of the car or its mechanism, tools excepted, but no repairs or replacement of parts will be allowed except to the ignition system and its parts, excepting that the driver and mechanic may make other mechanical roadside adjustments. Stations for supplies, such as gasoline, oil and water, will be arranged. Tire repairs and parts may be furnished by and carried on tire makers' supply cars, and tire makers' helpers may fit tires wholly or in part. But tire makers' cars must be regularly entered in the run in order to participate, as no cars of any kind will be allowed in the run unless regularly entered and numbered.

Before going to the starting line, entrants must present their cars to the technical committee for examination, to determine whether or not conditions are complied with, and again examined by the committee at the finish of the run. No car in the classes will be considered completely equipped unless it appears as cataloged or in advance sheets, except top and glass front. Chassis must all carry stock touring or runabout body complete, including regular tonneau or rear seats, fenders, steps, running boards, lamps, horns, mats, etc.

Where the car is driven with magneto, for which an extra charge is made, the amount shall be added to the price of the car at the time of entry.

Any manufacturer or agent entering a stock machine must agree to sell it at the entered price.

The route will be marked and flagged. Each division will have its separate pacemaking car. Trade entrants will receive framed certificates, and bronze medals will be awarded both professional and amateur drivers. The entry fee for professional or trade drivers will be $25 and for amateurs and owners not connected with the trade $10.

The management of the run has been placed in the hands of W. J. Morgan and the working out of the technical details has been entrusted to Alex. Schwalbach, who as secretary may be addressed at the Thoroughfare building.

G & J TIRE MEN MEET

Indianapolis, Ind., Aug. 30—Indianapolis was the mecca for a large gathering of men interested in the tire industry when the G & J Tire Co. held a 3-day conference of its representatives, beginning August 26. In the gathering all parts of the country were represented, as the company has eighteen branches and distributing agents. Luncheon was served daily at the Columbia club, after which the room was used for the meetings. The first meeting opened Wednesday at 1:30 P. M. B. C. Dowse, president of the company, opened the meeting with an address of welcome. In his remarks he advised the representatives that the rapid increase in the demand for G & J tires compelled the company to increase its capacity and that the company already had purchased a large amount of new factory equipment which would soon be installed and which would greatly increase its output next year. Of the matters of vital interest which were taken up and discussed, some of the most important to the trade were the company's new prices for 1909, and the new lines it intends manufacturing. While the new lines have not been given out to the public yet it has been learned that they will be in motor cycle and bicycle tires. The situation at the G & J tire factory this year has been unique by reason of the fact that it has been in operation 24 hours a day all season with its full capacity of workmen. Among the forms of entertainment offered the representatives were motor car rides over the city, a smoker and a chicken dinner.

ASKS FOR POPE DIVIDEND

Hartford, Conn., Sept. 1—Special telegram—Percy S. Bryant, of Hartford, as counsel for a creditors' committee holding claims originally in excess of $1,000,000 against the Pope Mfg. Co., today obtained from Vice-Chancellor Emery, of Newark, an order directing the receivers to show cause on September 8 why they should not be compelled to pay a third dividend of 25 per cent on the approved claims. There was incorporated in Mr. Bryant's petition a statement issued by the Pope Mfg. Co. August 31 showing deposits aggregating $1,152,561.99 in the bank. According to the petition $345,432.95 represents assets of other insolvent corporations owned by the Pope company and therefore not available for the payment of dividends.

KNOX IN VANDERBILT

Springfield Concern Nominates Two Cars for the American Classic—Entry Reopened

New York, Sept. 1—American makers are beginning to wake up to the opportunities the Vanderbilt cup race will afford for the demonstration of the speed and road qualities of their cars. A manufacturer hitherto not identified with road racing, the Knox Automobile Co. of Springfield, Mass., sprang a genuine surprise this week by nominating two of its stock cars for the Long Island classic. Both are of the 1909 vintage and of the four-cylinder type. Model M, a 48-50-horsepower machine, with 5½ by 5½ cylinders, is to be driven by Charles S. Basle, who scored records for H. L. Bowden at Ormond in his big Mercedes. Model O, a 38-40-horsepower car, with 4⅞ by 4¾ cylinders, will be piloted by William Bourque, who has been at Knox wheels in some hill-climbing contests.

The officials of the Springfield company had the speed possibilities of the Knox impressed upon them by the performances of their 1909 cars at the Wildwood, N. J., straightaway races on August 3. At this meet, Knox cars won eight out of ten events, scoring :47-⅖ for the mile, a rate of 76 miles an hour, and :28 for the kilometer.

In a trial for the Lowell race, however, Basle, over a measured mile, showed the Knox M capable of 81 miles an hour. The nomination of the Knox pair was made on September 1, the date originally set for the closing of preliminary entries. On that day, though, Chairman Thompson of the Vanderbilt cup commission announced that the double fee originally intended to be charged for entries made after September 1 up to October 1 would not be exacted and that the fee for all would remain at $1,000. This action was dictated by diplomacy and the uncertainties of the racing situation at present. The chairman realized the fact that some makers desired more time to reach a decision and others would very likely follow the example of the Knox people and compete in the race with high-powered stock cars.

On the date originally set for closing, the actual paid entries were a Mercedes, a Mora, a Chadwick, and the two Knoxes. Entries of two Locomobiles, a Thomas and a Roebling, were promised and plans were on foot for the participation of the Pope-Toledo and Frayer-Miller, Vanderbilt racers of 1906. Negotiations were also in progress for a Pennsylvania. A nucleus of thirteen cars was accordingly fairly well assured, with the claim that subsequent entries likely to be made by October 1 would raise the number of contenders to at least a score.

Robert Graves has secured Emile Stricker to drive the Jenatzy Mercedes, his origi-

nal Vanderbilt entry. Stricker has been a Protos pilot in the last two grand prix contests. He was some years ago a demonstrator in New York city for the late Alexander Fisher, at that time importer of the Rochet-Schneider. To Stricker's instructions, it will be remembered, Louis Strang attributed his success as a racing driver. The Mercedes pilot is expected to reach this country next week and will at once take up his quarters at Mr. Graves' racing garage at Mineola.

The Vanderbilt cup commission is scheduled to meet today. Mr. Vanderbilt sailed yesterday and is due to arrive early next week. Important developments are

The New York club's contest committee is making extravagant claims for its proposed race at Savannah under European rules. Its chairman seriously puts forth the statement that the entry of fifteen cars by foreign makers is assured. The only actual paid entries so far seem to be three Fiats, but claims of entries promised by other importers are made, and that the nominations of three Garfords, a Stearns, a Lozier, a Chadwick, an Acme and a Pennsylvania are assured.

"If all those European racing cars are actually to be on hand," remarked an American maker, "then it strikes me that American manufacturers who send stock cars way down to Savannah with strong chances of being merely 'also rans' are fit candidates for the easy mark class."

Two more American makes of light cars are assured of representation in the race for this class the Automobile Club of America proposes to run on the day before its contest at Savannah for big cars under European rules. A four-cylinder Buick will be driven by Edward A. Hearne, of Chicago. The Cameron Car Co., of Beverly, Mass., writes it will enter one or more air-cooled cars, as it believes that for the first time in the history of competitions of this descriptions an opportunity is afforded "to demonstrate to the public and trade the relative merits of air and water cooling systems for use in light cars."

SCENIC TOUR PLANNED

New York, Sept. 1—The "ideal tour" of New England promoted in the early summer by the Automobile Club of America proved so picturesque and pleasurable to the coterie of participants that the club plans an autumn run. The route selected by its bureau of tours is deemed rich enough in scenery to justify making the proposed junket-a-motor "the scenic tour." It will be an 11-day run of 935½ miles, starting on September 28 and ending on October 8. The route chosen crosses the Pocono and Catskill mountains, the foothills of the Adirondacks, enters the Lake George and Lake Champlain region, and carries the caravan finally across the Green mountains, whence the finish in New York will be reached by way of Waterbury, Conn. The route will be marked by green arrows with numbers referring the tourists to route cards.

LONG RACE IN TEXAS

Stoddard-Dayton Captures Exciting 12 Hour Track Event on San Antonio Track

San Antonio, Tex., Aug. 24—David Pryor's Stoddard-Dayton yesterday won the 12-hour endurance race at the international fair grounds race course in the most exciting driving exhibition ever seen in San Antonio. Staacke Brothers' Studebaker came in second, and G. D. Robbins' Mitchell touring car third. The Stoddard-Dayton covered 574 laps of the ¾-mile track, the Studebaker 560 laps and the Mitchell 539 laps. Only these three cars raced through the full 12 hours. A Thomas was the first to leave the course for good. It pulled into the paddock at 9:35 a. m. A bent axle caused by a tire exploding and throwing the machine against the fence caused its withdrawal from the race. The Mitchell roadster followed at 11:30 a. m. Engine and battery trouble was the cause of it being dropped from the contest. This left only the Stoddard-Dayton, Mitchell and the Studebaker.

These cars left the course one by one at intervals time and again for slight repairs and adjustments, only to reappear and again take up the drive around and around the egg-shaped track. It was an endurance race in more than one sense. The ability of the cars to stand the strain of rapid motion was thoroughly tested and the drivers went through 12 hours of tense, grilling work. None of the three drivers who stayed through the race had any rest during the 12 hours or more than a bite to eat snatched on the run. Within an hour all were coated with a heavy covering of grime and, steadily growing into the game, set their faces grimly on the track ahead and guided their machines unerringly over the course.

Several exhibitions of fine driving were given. That no accident occurred to mar the success of the day is attributed to the care and skill of the men at the steering wheel of the cars.

The feature of the entire race was the work of Alfred DeHymel, 18 years of age, who drove the Stoddard-Dayton to victory. DeHyman never had been in a race before, yet he handled his car with a skill that at all times baffled his opponents. A burst of speed that brought forth a roar from the grandstand was made by the Stoddard-Dayton towards the close of the race. With 10 minutes yet to run, the signal was given by the owner to Dehyman to "let her out." Previous to that time the car had been held in more or less. During the rest of the race the ground fairly burned under the long red racer. Within five laps the other two cars were passed twice. Cheers shook the amphitheater each time the car passed the stand.

More than 1,000 people witnessed the race. That wouldn't be much of a crowd at an eastern meet, but here in Texas this is regarded as a good attendance, particularly at a race that extended over 12 hours. When the event started there was only a sprinkling of people in the big grandstand, but as the day wore on the people turned out in larger numbers, so that when the Stoddard-Dayton romped home an easy winner there was what might be termed a big crowd out. The result was received with the greatest enthusiasm.

STICKS TO THE A. A. A.

Kansas City, Mo., Aug. 31—In deciding to run its 8-day reliability run, which is scheduled for September 19-26, under the sanction of the American Automobile Association, the Automobile Club of Kansas City refuted the rumors that it had withdrawn its allegiance from the national organization. President W. W. Cowen is emphatic in his denial of such an act and in a letter sent to the chairman of the A. A. A. technical board he says:

"I have today sent President W. H. Hotchkiss of the A. A. A. the following telegram: 'Cannot understand why rumor is so persistently circulated that the Automobile Club of Kansas City has withdrawn from the A. A. A. We wish to express to you most emphatically our allegiance to the American Automobile Association and to authorize you to deny any statement to the contrary.'

"Just as soon as our program is mapped out and everything is in shape, our secretary will be instructed to apply for a sanction for the Kansas City Star trophy endurance run. Later, in October, we will want a sanction for our annual race meet on Elm Ridge track."

The 8-day endurance run starts September 19, going to Emporia, Kas., the first day, distance 127 miles; second day, to Wichita, Kas., distance 113 miles; third day, to Enid, Okla., distance 114 miles; fourth day, to Oklahoma City, Okla., distance 119 miles; fifth day, to Guthrie, Okla., distance 46 miles; sixth day, to Winfield, Kas., distance 133 miles; seventh day, to Iola, Kas., distance 141 miles; eighth day, to Kansas City, distance 146 miles; total distance, 920 miles.

HISTORIC CLIMB ABANDONED

Paris, Aug. 20—After 6 consecutive years, Chateau Thierry has been abandoned as the scene of the annual autumnal hill-climb. Last year a soldier on duty was killed by a motor cyclist in his endeavors to avoid an over-officious local fireman. A lawsuit followed, bad feeling sprung up between the municipality and the organizers of the competition, with the result that the district has been definitely abandoned. Though the value of the Chateau Thierry hill-climb had gradually decreased as the motor car reached perfection, it still retained much of the importance which attached to one of the earliest testing grounds in the neighborhood of Paris.

Autumnal Garb for La Motoriste

Motor Veil in Two Sections

WHILE the enthusiastic motorist never really loses interest, it is everywhere acknowledged that the real season for motoring begins in September. And so widespread has become the active interest in motoring throughout the country, and so numerous are the members of the gentler sex who can intelligently discuss the merits and demerits of a car, and do not hesitate to undertake a long tour through a section of country of which they know little aside from the facts that its roads are rough and its inns of uncertain quality, that it is not surprising that the question of suitable garb should have become one of vast importance. Certain it is that the woman who wishes to travel in comfort appreciates the necessity of providing herself with an outfit which will not only perfectly protect her from dust and cold, but will enable her to always present a smart, trim appearance.

For the earliest weeks of autumn, when the days are still warm, the best sort of motoring coat is one of the rubberized taffetas or English mohairs, which are to be found in every imaginable shade and pattern, notably the wide stripes and checks now considered so smart in tailored suits. These coats are made up in various ways, although invariably long and loose, but not so roomy as to utterly disguise the lines of the figure, as was the case in the earliest models. There is, however, a marked change in the sleeves of the newest coats as compared with those made a few months ago, which it behooves every woman to carefully note. This change is due to the very radical differences between the gowns of this year and last—the directoire influence having so marked an effect upon the sleeves of every garment that to wear anything savoring of the balloon order is to frankly announce one's self as being behind the times—from a sartorial viewpoint. This is not saying that motor coats have tight sleeves, for that would be an absurdity that no woman of taste would tolerate. The majority of them, however, are of the modified coat order and are put into the armhole without an atom of fullness, precisely as are the sleeves of the coats worn by men. Beyond this feature and the fact that pockets are larger and more prominent than heretofore, these rubberized medium weight garments show few changes, for the satin and silk neckties worn last spring are still in evidence and so are the contrasting satin insets on the coliar and cuffs.

In the realm of cloth motoring coats there are several fabrics employed which heretofore have not been in general use for that purpose. One of these, and a material, by the way, which is considered immensely smart abroad, is the rough-faced English tweed in London smoke gray, which has almost invisible stripings of black, and another is chinchilla cloth, which, while undeniably a cold-resister, is rather too weighty to appeal to some women. The cloth motoring coats are of both three-quarter and full length, and a feature of their treatment is the perfection of the tailor-finished edges and the manner in which the bulk is taken from about the hips by means of the cleverly sloped side forms. While the cloth coat, like the lighter one of mohair and silk, has double-breasted fronts, its back may be made many inches narrower and in fact many of them are almost semi-fitting, although not in the least suggesting tightness. Some of these heavy cloth coats, and especially those brought over from London and Paris, have detachable hoods and capes of the same material, so that in some climates they will do duty all winter, especially if the cape, as is often the case, is fur-lined. A coat which is a compromise between cloth and fur, in that it possesses attributes of both types, is a heavy double-faced English tweed made on the conventional lines of the ulster and supplied with an exceedingly high collar lined with otter and wide cuffs of the same fur. This is an ideal garment for mid-autumn and cold evenings, as the throat and forearms—most vulnerable parts of the body—are adequately protected.

The woman who is nearly related to the owner of a motor car and yet has not the income to warrant the purchase of a varied assortment of long coats, would best purchase a practical garment of rough cheviot, which may be worn on street, railway, steamer or motor. Naturally, such a utility coat should not be very weighty, owing to the discomfort of walking about in it and the fatigue involved by carrying it. Nevertheless, it may be very smartly lined throughout with striped silk or satin, have one of the new deep hoods, tassel trimmed, and a detachable shoulder cape of several sections. To provide additional warmth when necessary, every woman contemplating a motoring trip should provide herself with a sweater. The latest designs in these garments are so attractive, and withal so practical, that they will instantly appeal to the woman who wishes to be garbed becomingly as well as comfortably. These motor sweaters, as they are termed,

Designed for Fall Motoring

STRIPED SILK RUBBERIZED COAT

actually extend half way to the knees and cling so closely that their presence is not detected even underneath a semi-fitting coat. The daintiest of these are in white with dark brown or blue borders.

For some occasions, such as a race meet or a hill-climb in a fashionable locality, it is necessary to wear a hat of as dainty character as possible, commensurate with the sport. Many women, after long—and costly—experiments with motoring head gear, have fallen back upon the dust and rain-resisting Panama, which is also uncrushable and flexible.

The smartest motoring headgear is undoubtedly the visored cap which precisely matches the coat, but the most comfortable and the type much affected at this season by women who take long tours is the silk baby hood over which is tied a mask veil fitted with isinglass eyes. The double veil is now so generally used with motoring garb that almost every woman knows that it must be so arranged over the hat crown that there shall be four ends—one pair falling forward and the other backward.

Composition of Magnalium

THE magnesium-aluminum alloy known as magnalium is interesting from its lightness and, further, that small amounts of heavier metals, such as nickel or copper, may be added to it without raising its density above that of the fundamental metal, while at the same time considerably altering its mechanical properties. The evolution of magnalium has been somewhat slow. Woehler in 1866 prepared two definite alloys, Al_2Mg and $AlMg_2$, but these were of no practical use, both being brittle and easily oxidized. Since then many attempts have been made to obtain air-resisting magnalium alloys of good mechanical properties, and in many of these the idea of adding very small amounts of active heavier metals, but still keeping within the density of aluminum, has been more or less completely carried out. In a number of these alloys, for which during the past few years patents have been taken out, the magnesium has been stated to range from 2 to about 30 per cent of the aluminum. The general tendency has been for the amount of magnesium to be reduced, as the alloys containing much of this metal are mostly unworkably hard and brittle.

Alloys of magnesium and aluminum containing more than 10 per cent of magnesium have been thoroughly studied, and in these alloys the strength diminishes as one recedes from either of the pure metals. Alloys in which the proportion of each constituent exceeds 15 per cent are brittle, the maximum brittleness being reached with a 50 per cent alloy which can be crushed by the fingers, as experiments have demonstrated.

Between the first six alloys the difference in the percentage of magnesium is very small; in fact, with some of them the amount of magnesium contained is the same, the difference in quality being made up by infinitesimal additions of other metals. All of these alloys show a considerably greater strength than aluminum and a much higher resistance to corrosion than aluminum. They also can be tooled at a much higher speed than aluminum. In the various alloys outside of the special tubing alloy and the 10 per cent alloy the percentage of aluminum is from 94 to 96 per cent.

A sample of alloy "X" which was carefully analyzed showed that it contained 1.76 per cent copper, 1.60 per cent magnesium, 1.16 per cent nickel and antimony and iron in very small quantities. Alloy "Y" showed copper, magnesium, tin, lead and a small amount of iron and a doubtful trace of antimony. "Y" is intermediate in composition between "X" and "Z" except as regards nickel. Alloy "Z," which is especially adapted to soft sheets, contains 3.15 per cent tin, 0.21 per cent copper, 1.58 per cent magnesium, 0.72 per cent lead, and about ⅓ per cent iron. Traces of titanium were found, presumably derived from bauxite. Indications of other rare metals were obtained.

The most noteworthy result of the analytical work is that in no case was as much as 2 per cent of magnesium found. The highest result was 1.86 per cent in the soft sheet. In the form of castings, decreasing the percentage of aluminum and increasing the percentage of magnesium results in an increase of tensile strength and, of course, in making the metal harder and more brittle. For instance, the ordinary quality of magnalium shows a tensile strength of from 18,000 to 21,000 pounds cast in dry sand and from 22,000 to 25,000 pounds per square inch if cast in iron chills.

NEW IDEA IN MOTOR SWEATER

The Readers' Clearing House

EDITOR'S NOTE—In this department Motor Age answers free of charge questions regarding motor problems and invites a discussion of pertinent subjects. Correspondence is solicited from subscribers and others.

LOSES MUCH POWER

Oshkosh, Wis.—Editor Motor Age—Will Motor Age tell me how to increase the power of gasoline in my motor, the amount of gasoline to use in starting the motor and the proportion to use for running same?—Fred Athearn.

It is rather difficult to give a method for increasing the power of your motor as you do not state the carbureter you use, your ignition system or your lubricating system. It may be that your carbureter is too small, you mixture may be weak, the valves may be timed poorly, the motor may be dirty; in fact, there are a score of reasons why you are not getting power. The proportion of mixture in your carbureter should be one of gasoline vapor to fifteen of air. Your carbureter should be adjusted so that the gasoline in the spraying nozzle stays just below the head of the nozzle so that it will not overflow with the car idle. If you are not feeding enough gasoline, you are having considerable missing; if you are feeding too much, you will get black smoke in the exhaust; if your timing is too fast you will get some pounding in the motor; if the spark is too slow you will get heating. Adjust your carbureter—whatever make it is—according to the directions given by the maker of the carbureter, and ascertain if you have compression in all of the cylinders and if not have the trouble rectified. You may be lubricating poorly, which invariably results in loss of power.

VARIETY OF MOTOR TROUBLES

Syracuse, Neb.—Editor Motor Age—Will Motor Age answer the following questions through the Readers' Clearing House? I have made a bet with a second party that the modern high-tension magnetos as used on cars are capable and do put out current at a voltage of between 15,000 and 20,000 volts. Also that the modern vibrator coils raise the 6-volt primary current to practically the same voltage. Do I win or lose? What is the trouble with a double opposed motor when it runs perfectly at high speed propelling a car either on the level or up a grade, but the moment I attempt to make a slow pull on high gear on a hill it begins to pound and retarding the spark does not stop it? In starting into a grade from a standstill it is now impossible to make the motor pick up its load on high gear, starting on low first, without pounding, while heretofore the motor always has been equal to any pull required of it without the slightest sign of distress. The timer has not slipped on the shaft; there is absolutely nothing wrong with it. The motor is fed by a Schebler carbureter. I have laid my trouble to poor carbureter or vibrator adjustment. Can a vibrator—Splitdorf coil—be properly adjusted by sound without running the motor? Can a carbureter be properly adjusted with the motor running idle, not pulling the car?—W. C. Lambeth, Jr.

The modern high-tension magneto is capable of throwing a current of from 40,000 to 50,000 volts. In regular practice there is a safety short circuit at 12,500. The ordinary induction coil is capable of transforming a low-tension circuit to from 20,000 to 40,000 volts. The trouble with a motor such as you refer to pounding on a slow pull on high gear is that you have not a sufficiently rich mixture for the work the motor is called upon to perform. If a motor that would ordinarily pick up on the high fails to do so and you have to drop to the low, give it a little more gasoline. It may be that the batteries are weak, which would cause an appreciable lack of power. Too little oil going to the motor parts will cause the same trouble. In adjusting the coil, while this can be properly done without the motor running, it is much better to have it in operation. The majority of makers adjust carbureters with the motor running idle, and then try out on the car, stopping occasionally to make whatever changes of adjustment the work may demand. It rarely happens that a carbureter can be properly adjusted until the car has been tried out at different speeds. It is customary in adjusting carbureters to follow closely the directions given by the carbureter maker; but a good plan is to adjust the needle valve for low speeds and the auxiliary air valve for high speeds.

GASOLINE DRIPS FROM CARBURETER

Miami, Fla.—Editor Motor Age—In a Rapid truck which I operate considerable trouble arises from gasoline dripping from the carbureter after the motor is stopped. I have lowered the float and finally bought another carbureter of the same make, but with the same results. The system is of the float-feed type. If any of your readers can help me out, I will appreciate it very much, as the dripping is not alone wasteful but is also dangerous.—Walter Waldin.

As you do not say just where the gasoline drips from, or how long it continues after the engine has stopped, any diagnosis that we can make of the trouble can be nothing more definite than a conjecture. It may be due to capillary action, the level of the gasoline in the float chamber being so close to the opening of the nozzle that this goes on steadily, or it may be due to a poor adjustment of the carbureter, the engine getting a mixture more or less rich in liquid gasoline, which, while the motor is running, is consumed, but once it is stopped the amount that has collected in the manifold begins to collect and drip out. Lowering the float should prevent the former, while a correct adjustment of the needle valve to suit the demands of the motor for fuel should avoid the latter cause. It is quite probable that the trouble is due to neither of these, and if any of our readers have had a similar experience which puzzled them to the extent of investing in a second carbureter, they are quite welcome to explain the cause and the remedy they adopted, in these columns.

HAS GRAPHITED WOOD FIBER

Elmira, N. Y.—Editor Motor Age—On page 18, August 6 issue, you mentioned the use of graphite wood fiber for preventing noise in planetary transmissions. Will Motor Age give us the address of any firm making such a lubricating preparation?—Elmira Arms Co.

The Joseph Dixon Crucible Co., Jersey City, N. J., manufacture graphite wood fiber for this purpose.

HAVE USED BELT DRIVE

Philadelphia, Pa.—Editor Motor Age—What information has Motor Age on the employment of belt drives for motor cars? Belting is employed for driving machinery under the most severe conditions, out of doors as well as under cover, and as the belting on a car could easily be protected, as is most of the machinery now, there seems to be no reason why it should not be a practical solution of the problem of transmission.—Inventor.

Belts have been used on the motor car. The German Benz cars back in the nineties had a belt transmission, and not a few others have followed the example of these pioneers, only to give up the use of anything so frail and uncertain as leather and canvas for the transmission of the power under conditions which cannot be approached by any other form of service for severity. True, motor cycles still employ belts to transmit the power in a number of different types. The tendency throughout engineering practice is to do away with the belt altogether wherever it can be dispensed with, and machines that cannot conveniently be directly connected to the source of power are now very largely chain-driven. The latter is positive and at the same time permits of a certain amount of flexibility through the looseness of the chain. There is no good reason why a transmission using chains altogether to give the different speeds would not be feasible, particularly where a chain of the "silent" type, such as the Renold, were employed, but in the light of present design, it would be far from practical. That

is, in the sense of being a commercial success, as the tendency is almost entirely toward the shaft-driven type of car. Belt drive was employed 1 year ago on the Price runabout built in Chicago, but of late nothing has been heard of the outcome of this enterprise. The Panhard company employed belt drive on one of its earliest models and one other French concern used it until a year ago, when it was discontinued.

WIRING MODEL F BUICK

Taylor, Tex.—Editor Motor Age—Will Motor Age tell me how to wire a Buick model F car, which has a double-opposed cylinder, Splitdorf double-dash coil with switch, Herz timer, and extra set of dry cells and storage battery? I purchased a car of this type which had been damaged by fire and the ignition is completely gone. —K. J. Peterson.

In wiring a Buick model F, the accompanying diagram will be of assistance. In this, A represents the storage battery, B the group of dry cells, C1 and C2 the front and rear cylinders, and D is a full face view of the coil box. The high-tension wires H1 and H2 connect direct from the end terminals at the base of the coil with the spark plugs on the front and rear cylinders. The negative post of the storage battery A, and the negative of the dry cells B connect by a common ground wire G with the engine cylinder. The wire B1 from the positive of the dry cells connects with the primary binding posts beneath the center of the coil and the wire A1 from the positive of the storage cell A connects with the other primary beneath the coil. From the timer connection wires T1 and T2 connect respectively with terminals at the back and top of the coil, which are those from the vibrators.

THREE OIL QUERIES

Montezuma, 'Ga.—Editor Motor Age—Will you please answer, through the Readers' Clearing House, the following questions? 1—I am driving a model 34 Rambler. The oil pipe from the lubricator to the No. 1 cylinder is 10¾ inches long, and it often breaks. How could I fix it so that this would not occur? 2—What amount of oil should be fed to the cylinders, using a McCord & Co. four-feed lubricator; how many drops to each stroke of the pump? 3—In about what proportions should graphite and oil be mixed for transmission cases? 4—Why is it that a car seems to run better at night than during the day?—C. S. F.

In repairing the oiler pipe to No. 1 cylinder, use annealed copper tubing 5-16-inch diameter, twenty gauge, and cut the tubing 4 inches longer than necessary, putting in it a curl or loop 2½ inches in diameter. The presence of this loop will obviate any future breaking in that it will absorb the vibration. The number of drops of oil per stroke of the pump differs according to the different oils used. If Marshall oil, obtained from Marshalltown, Ia., which is a thin light oil, grade French C being preferred, is used, one drop to each stroke of the pump is sufficient. This oil is of the non-evaporating class and well suited for this work. With other oils two drops per stroke of the pump is sufficient. In mixing graphite and oil for transmission cases use Dixon's flake graphite, a grade specially for transmissions, and mix it with a thick oil similar to that used in the cylinders of steam engines. Twenty-five per cent graphite to 75 per cent oil will be a suitable mixture. You will undoubtedly discover that cars run better at night and seem to have more power at nights in the warm weather than in the cold. This is due to the moister nature of the air which enters the carbureter at night, as compared with in the daytime. The moister the air the more oxygen in it and the greater charge will be drawn into the cylinders, the result being a better and stronger explosion. With hot dry air entering the cylinder the same amount does not enter as if it were cooler.

LOOKS FOR RACING EVENTS

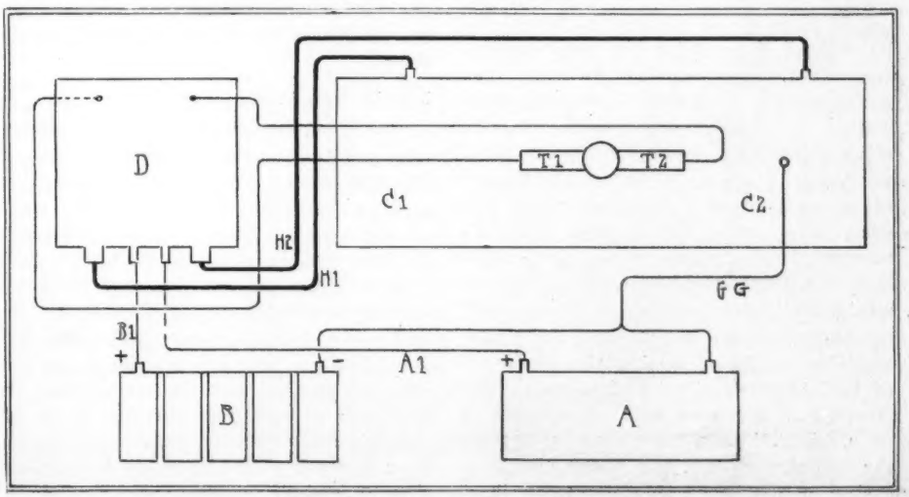
Fort Thomas, Ky.—Editor Motor Age—I have been a reader of Motor Age for more than 5 years. I have been driving motor cars since 1900 and have handled some of the most powerful touring cars made. At Latonia last fall I lowered the record for touring cars at 25 miles with A. V. Stegeman's Stearns, making twenty-five laps on a mile circular track in 29:30 with full road equipment. I now desire to get in on some of the big events and trust that Motor Age can put me on the right road. I can furnish any amount of references as to my driving and can make all repairs on any car. At present I am driving a Darracq and Stearns.—John R. Raimey.

Track racing is not in much prominence fall it is expected that several contests of importance will take place, the dates at the present time, but during the coming for none of which are already fixed. In road racing events the Vanderbilt cup race, October 24, is one of the biggest of the year, entries for which close October 1. The Kansas City Automobile Club will schedule a contest for October, and other clubs are looked to to make early announcements of track races.

REPAIR PIT NEEDLESS

Mt. Vernon, N. Y.—Editor Motor Age—Being possessed of more than the average run of mechanical ability, and contemplating the erection of a private garage where I can house and take care of my own car, I would like to know if you consider a pit an essential part of such a building. My mechanical knowledge has been gained in lines other than that of motor car repairing, and while in the early days the sight of a driver lying underneath a machine was quite a frequent one, I must say it is something that I have not noticed for a long while. I do not know whether this is altogether on account of the motor car having been improved to such an extent that similar attention is no longer necessary, or whether the development has only progressed to a point where this can be given in a garage, and this is the reason why it is no longer done on the street. In your opinion, would a pit justify the expense entailed in making it.—Engineer.

The construction of a pit merely to take care of such repairs of this kind as would be necessary on a single car would be a needless expense. Even where it is the owner's intention to effect repairs of every kind within his ability to handle with the facilities available in a small private repair shop, the construction of a substitute for a pit is so easy and so much more economical as to place the latter out of the question. The frequent necessity for lying down in the mud beneath the car in former days was largely due to the fact that American designers favored the horizontal type of motor and many of its essentials could not be conveniently reached in any other way, though probably it is somewhat of a misnomer to use the word convenient where crawling beneath a car is concerned. The



WIRING DIAGRAM FOR BUICK MODEL F

placing of the motor forward, and the tendency toward a unit type of design in which the gearset is either a part of the motor unit or is combined with the rear axle, has made the occasions on which it is necessary to get beneath the car so rare that nowadays neither a pit nor a substitute is considered essential. In case of a repair to the propeller shaft, it would be easier to remove the body of the car.

EQUIPS GASOLINE-ELECTRIC

Chicago, Ill.—Editor Motor Age—About a year ago a man called on us and proposed to put a gasoline engine and dynamo into our electric 5-ton truck to generate enough electricity to run the motors on truck, instead of using storage batteries. Our batteries are about used up, and a new set would cost about $1,000. If we could locate the people who do this work we would probably try the new system. Have you any way of finding out who do this work?—Chris. J. Wolff.

The combination gasoline-electric system, to which you refer and which has been in use on the Armour truck for some time, was brought out by John R. Markle, 4204 Michigan avenue, Chicago. In this system a four-cylinder gasoline engine is used to drive a generator and the current from the generator delivered direct to electric motors on the rear wheels. In this particular system the heavy storage battery so often needed is eliminated, which is made possible by a peculiar generator construction and control system. Motor Age observed this truck on several occasions and it performed with the utmost satisfaction.

LIKES DEMOUNTABLE RIMS

St. Charles, Ill.—Editor Motor Age—I was particularly interested in the editorial in Motor Age in the issue of August 20 on demountable rims, in view of the fact that I have used these on my Apperson car for a couple of seasons and would not be without them under any consideration. I, however, take exception to the first two sentences in the last division, which states: "A present argument against demountables is the length of time required to change a casing on a rim at the end of a day's run, or during a day's run, when more punctures occurred than the number of extra rims carried. At present it is hard work making a change with a straight clincher because of the trouble securing the nuts to the short lug stems, and the trouble of getting the beads out of and into the clincher lips with little leverage as compared with when a rim is on a wheel." My experience is directly the opposite to this, and I can change a casing on a demountable rim when it is off the wheel quicker than the same casing when the rim is on the wheel. I use 34 by 4½-inch tires, and recently took an old tube out, put a new air tube in, partly inflated it, tightened all of the five lugs, and had the rim ready to put on the wheel, except for the additional inflation needed, in 10 minutes. With the use of an air bottle I can take the rim off the wheel, remove the punctured inner tube, put in a new tube and have the rim back on the wheel, properly inflated, in 15 minutes, doing all of the work myself. When the present finders furnished with the Harburg-Crescent rims are used the trouble of entering the lugs is a small one. With the exceptional advantages offered by demountable rims there is no reason why they will not soon be sold as regular equipment on the highest-priced American cars, as they are today sold with many of the best European machines.—N. H. Van Sicklen, Sr.

WHO MADE THE ENGINE?

Charleston, S. C.—Editor Motor Age—A little over a year ago we bought through J. N. Willys Co., Elmira, N. Y., a Detroit touring car, built by the Detroit Auto Vehicle Co., Detroit, Mich., both of which concerns have gone out of business. We have had an accident to our machine and we would thank Motor Age to put us in communication with the manufacturer of the engine in order to procure the necessary repair parts, as it would be very expensive to have them made.—Automobile and Marine Motor Co.

Motor Age is at a loss to state definitely the make of motor employed in the cars built by the Detroit Auto Vehicle Co., Detroit, Mich., for the 1907 trade. As near as recollection serves this motor was either manufactured by the Beaver Mfg. Co., Milwaukee, Wis., the Milwaukee Motor Co., Milwaukee, Wis., the Milwaukee Auto Engine and Supply Co., or the Davis Mfg. Co., Milwaukee, Wis. Definite information on this subject from any of the readers of Motor Age will be greatly appreciated.

BUICK NO. 10 EFFICIENCY

Conneaut, O.—Editor Motor Age—Reading with considerable interest Motor Age's report of the gasoline test per mile at Harrisburg, Pa., August 18, in the issue of August 27, I thought its readers might be interested in knowing what a car had done that was not tuned up for the occasion and certainly not handled by an expert. My No. 10 Buick, purchased last April and run by me over 2,800 miles and with no repairs to engine or adjustment whatever excepting carbureters, took me through from Conneaut, O., to Sandusky, O., a distance of 134 miles, on a little less than 5 gallons of gasoline, and while Mr. Fortune, who accompanied me, is a better driver and understands a car, he does not claim to be an expert; we were not acquainted with the road and for 6 miles went wrong and had sand to pull through. The little Buick, equipped with all the extras that I have added to it, weighs just 1,950 pounds, and at the time of this trip had 30 by 3-inch tires, which are too light, as with that weight of car the tires should be 3½ inch, which I have since put on.—L. F. Dunbar.

MICHIGAN-MONTANA ROUTE

Coldwater, Mich.—Editor Motor Age—Will Motor Age give me the best route from Coldwater, Mich., to Livingston, Mont., or advise me where I can obtain a guide book giving such a route.—G. B. Wicher.

Motor Age is not aware of any guide that would prove suitable to direct you from Coldwater, Mich., to Livingston, Mont., but gives here the general course followed by the trans-continental Franklin car. The route is as follows: Coldwater to Chicago by way of South Bend and Hammond; Chicago to Clinton, Ia., by way of Geneva, DeKalb and Dixon; Clinton, Ia., to Omaha, through Cedar Rapids, Marshalltown, Ames and Carroll; Omaha to North Platte, through Fremont, Grand Island and Kearney; North Platte to Cheyenne, by way of Julesburg and Cheyenne; thence through Wyoming, through Laramie and Rawlins. From this point practically a northern course must be taken through Wyoming to the Montana boundary, and thence north through Montana to Livingston. Nothing whatever of this route is known, and it is questionable if it is passable to a motor car. It is also problematic if a more northerly route cannot be taken, as it is very mountainous north through Wyoming and into Montana. If a course through North Dakota and thence through Dolson, Yellowstone and Sweet Grass counties in Montana could be found, it might be a much easier one.

SUBSTITUTION IN OILS

New York—Editor Motor Age—Many motor car users are beginning to realize the prevalence and danger of the substitution evil, which is particularly regrettable in the oil business, in which not infrequently inferior grades of oil are sold under the representation as being high-grade. There are two kinds of substitution; one perfectly legitimate, where the dealer states he has not the oil called for in stock and offers another brand under its proper name; the other, a deliberate defrauding of the customer consists in palming off some cheap and inferior oil as compared with the brand asked for. Every now and again some one sends into my office a sample of oil that was bought for Panhard or some other advertised brand. On examining it I find the oil to be a cheap grade of paraffin or a cheap grade of neutral oil, such oil, in fact, as no responsible house would send out for the lubrication of gasoline engines. I am

a manufacturer and an active competitor, but I mean to be a fair one. It is an outrage on reputable manufacturers of high-grade oils and on the consumer who pays the price of a good oil for dealers to substitute an inferior oil, and yet I know and you know it is widely practiced, and that, too, by a class of dealers and garage managers who ought to be above such actions. I know of garages that sell from four to six brands of oil and they buy only one, paying less than 15 cents a gallon for it. The remedy that I suggest for the protection of the public is that the owner of a motor car order his oil from some manufacturer, with a well-established reputation. If you know of any better remedy I wish you would let me know what it is.—T. T. Southwick.

CHICAGO SPEED TRAP

Evanston, Ill.—Editor Motor Age—I want to inform the motorists around Chicago and suburbs that there is a policeman stationed two blocks south of North avenue and north State street, who has stop watches, etc., and is very anxious to get business. If the motorists are advised of this situation it will save them much cash.—A Victim.

NOISY PLANETARY GEARSETS

Richmond, Va.—Editor Motor Age—I have a light four-cylinder runabout, and although it is new, only been run a few months this season, I find that the planetary transmission makes what appears to be a great deal of unnecessary noise on the low speed, and more particularly on the reverse. I have been using oil in it as a lubricant, and the local repair man informs me that a compound which is a heavy mixture of oil and grease would remedy the trouble. Not having any too much confidence in the repair man, I would like to have this from some higher authority before applying it. Will it do as recommended, and, what is more important, will it have any bad effect?—W. T. Lansing.

Given a large number of metal pinions running together and noise is inevitable; make these pinions small and revolve them at a high speed and the undesirable effect is increased. This is the case of the planetary gearset on the small runabout of today. Its pinions are very small and they have to revolve at a very high speed, so that the elimination of the noise is impossible. Whether it is advisable to attempt to muffle it is another matter. Makers of such cars usually advise the use of a light oil in the gearset on account of the small size of the pinions and their high turning speed, owing to the much greater resistance a heavy lubricant would impose on them. The use of such mixtures as you suggest will drown the noise to a very great extent, and as both the low-speed and reverse gears are employed but little on such cars, it is a question whether it is better to put up with the noise during the comparatively short time in which its presence is unavoidable, or to fill the gearcase with a heavy lubricant and put up with the loss in efficiency for the same reason, that is, that the working under such conditions only lasts but a short time. The use of these mixtures for this purpose cannot do any harm that we can see, and is not so apt to leak out of the case as is the oil, so that where a driver prefers a slightly lesser efficient gear to an extremely noisy one, there appears to be no reason why he should not make use of such a lubricant.

COMPARES TYPES OF CLUTCHES

Toronto, Ont.—Editor Motor Age—During the last 4 years many makers have discontinued the use of the cone clutch, adopting the multiple-disk variety, the reason for which action I am at a loss to know. However, this seems to have been largely the case, at any rate as far as my observation extends, with new makers in the field, and with old-established makers where they brought out new models. Despite this general tendency, for it certainly does seem to be very general, some of the most prominent makers still stick to the cone clutch, so it seems to me that there must be something more than the reasons which appear on the surface for its retention in one case and its abandonment in favor of the multiple-disk type in the other, particularly as the later type of clutch is much more expensive to build, although the later fact does not appear to prevent its adoption on low-priced cars. By way of enlightenment, both for myself and doubtless a great many others who are equally interested, will you briefly sum up the good and bad points of the leather-faced cone clutch. I have driven a car equipped in this manner for 3 years now and I have had very little occasion to find any fault with it, nor have I had to go through the long list of ills that so many of your correspondents detail concerning their experience with their cone clutches.—Friction.

As was the case with practically every other essential of the motor car of early days, many mistakes were made in the design of the first cone clutches, so that their refusal to work satisfactorily was not the result of there being an inherent defect in the principle, but lay almost entirely in their design. We say "almost entirely," because a development that has since come into existence has had a great deal to do with the improvement of the cone clutch since, and that is the cork insert. Many of these early clutches were designed with an improper angle of contact, then again, the spring pressure was insufficient, or in the case of a clutch of large diameter, improperly applied, though the most prolific source of trouble was the manner in which the clutch was mounted.

Frequently the side members of the frame were depended upon to some extent to preserve the alignment of the motor, clutch and gearset, and where insufficient means were employed to permit the clutch to center itself in the flywheel automatically, regardless of its relation to the gearset, it was not to be wondered at that trouble followed after the car had been in use a comparatively short time, as the frame either received a whack that put it out of true, or it sagged sufficient to give rise to ills that were nearly always traced to something else.

Given the correct angle of contact, a proper mounting that will permit the clutch to center itself in the female member regardless of its relation to the other essentials of the transmission, the leather-faced cone clutch will be found very satisfactory, and it can readily be made of such small diameter and of such weight that its inertia will not interfere with gear-changing. Another source of trouble on early cars was the leakage of lubricating oil out of the crankcase, and this found its way along the crankshaft and onto the facing of the clutch where it naturally destroyed the friction properties of the leather against the cast-iron and caused such an amount of slipping that the clutch often became virtually useless from this cause. This gave rise to the use of numerous applications, such as resin, talc, fuller's earth and the like, which, of course, were nothing more than makeshifts. Better design has served to eliminate this source of trouble to a very large extent, while the adoption of cork inserts, the coefficient of friction of which is not influenced by oil, did away with it entirely, beside effecting a vast improvement in the conical type of clutch as a whole. This, together with the fact that their clutches were probably better designed in the first place than many of the others, accounts for the retention of the conical type by some of the best known American makers.

But there has been another factor at work, where the adoption of the multiple-disk type of clutch is concerned, and that is that it can be said to merit the term of "fool-proofness" to a much greater extent than any other, and, moreover, it does not require anything like as much skill to handle it properly as does the cone clutch. In other words, it takes a better driver to handle a car with a cone clutch than one with a multiple-disk, especially at the outset, before the peculiarities of the car are known by the driver. The ability to run a multiple-disk clutch constantly in oil is another factor of great importance in its favor, and as the disks may be made of small diameter and very light, the inertia effects are reduced to a minimum.

DIRECT INJECTION OF FUEL FOR MOTOR CARS

EDITOR'S NOTE—"The Direct Injection of Motor Fuel" is contributed by Thomas J. Fay, E. E., president Society of Automobile Engineers.

WHILE it is true the direct injection of fuel into the combustion chamber has not been favored in the past, it is something of a question if, in the course of events, this mode of the utilization of fuel may not be taken up. Irrespective of the fact of its future application, there are points of interest to be noted, and it will be advantageous to discuss them. In order that the matter may be better understood, it will be necessary to go back over the ground, as it will be remembered that carburation was a very serious matter from the start.

Earlier attempts to employ liquid fuel were in connection with carbureters of the "lake" type, in which a pool of liquid fuel was so situated as to interrupt the inflow of air, with the expectation that the air would become saturated with the hydrocarbon and thus become an explosive mixture. Expectations were realized, in a way. The air did pick up the hydrocarbon, and the mixture was to a certain extent adaptable. It was not uniform, however, or was it possible to utilize all the liquid fuel put into the receptacle at any one time, for reasons that we now know more about.

To begin with, it will be necessary to discuss the characteristics of the fuel used, to understand why all of it was not picked up by the air as it passed over or through the fuel, as the case may have been—there were several detailed methods—on its way to the combustion chamber. The fuel exclusively used at that time was of the "olefiant" hydrocarbon series, distillates of crude oil, in fractional form. The product was delivered on a basis of specific gravity, and the lighter distillates were selected for the purpose. The lighter distillates afforded the most uniform mixture, and it was then thought that the failure to realize a uniform mixture for all the gasoline in the container was due to the failure of the vendors of the gasoline to deliver what the specifications called for.

Experiences of the Pioneers

The fundamental difficulty was overlooked, for the most part, on account of lack of knowledge of the peculiarities of the fractional distillate, and, furthermore, in consequence of the very crude nature of the devices used. It dawned upon the pioneers in the course of time that the fractional distillates of crude oil were defective for the purpose, in that the components were not all of the same degree of volatility. The more volatile portions were carried over first, during which period the carburation was the most perfect. Then the mixture would become "leaner," and trouble would be rendered manifest.

By the time half the gasoline was vaporized the remaining portion would be so resistant as to render further action futile, and the motor would cease to perform its functions. Various designers resorted to diverse means to overcome the defect, but to no avail. It was in 1896 that the author took up the task of correcting the defects of the methods as here set down, only to find just what is here related, the fault was in the gasoline, not on the basis as suspected by the then designers—failure to receive the gasoline of a specific gravity as ordered—but on a basis of difference in volatility of the components of the distillate.

One of the very first schemes for correcting the evil may have been the invention of "Raymond"—the author is not positive. The plan consisted in "spilling" the gasoline over a brass wire mesh, rolled up into cylindrical form, and causing the air to pass over and through the wetted wire mesh. For stationary work this scheme was the best of the time, in so far as the author can discern. The gasoline was pumped from a low to a high level and spilled over the wire mesh, while the excess ran back by gravity to the lower tank. The wire mesh was inclosed in a glass tube.

Float Feed Carbureter Discovered

Even this scheme, as will be readily seen, failed in part, because the less volatile portions of the distillate would go by time after time, and in the end the residue piled up to a vast extent. At such a time, to remove the whole of the remaining gasoline, and substitute a new supply was the only remedy. When the principle of the float-feed carbureter dawned on the minds of the engineers who were struggling with the ills of the earlier schemes it was at once to be seen that the less volatile products would be impelled with the more desirable portions into the combustion chamber. This proved to be a lasting benefit, and while the float has been done away with in certain types of carbureters, the principle remains, in that all the gasoline is passed into the motor.

It was thus proven that the less volatile products would serve as fuel were they properly handled, and in the main the value relatively was a matter of heat units contained in the fuel. It has been shown that the hydrogen component is of the greatest importance in the fuel, in that the increase in hydrogen rendered it possible to speed the motor, considering a given compression, because fuel rich in hydrogen possesses a low temperature of inflammation relatively to the other products of the compound. It is easy to see how hydrogen rendered the mixture easy of ignition and of a high rate of the flame propagation under conditions of high speed in which, unfortunately, the compression recedes.

The compression in the earlier types of motors was lower than it is in 1908, but the reason was well under the surface. The fuel of the time was richer in hydrogen than it is at the present time. The mixture ignited more readily and the flame propagation was more marked. Ignition troubles led to a higher compression. With higher compression the fuel problem was modified to some extent, but it is still an ever-changing bugbear. Because the fuel is not stable, either in the matter of quality or price, designs are influenced to a greater extent than one would be led to suspect.

Volatility Is Measure of Quality

Liquid fuel is really delivered on a basis of its boiling point, and not with respect to its specific gravity. Volatility, then, is the measure of quality, since the calorific value does not vary very much in the several products as delivered. The difficulty likely to be experienced, in view of the method of procedure, lies in the fact that the limits of the boiling over—fractional distillate—process may not be so closely held as to assure reasonable closeness of volatility as between the components of the composition. In view of this and other facts to be disclosed lies the interest in the question of the direct injection of fuel into the combustion chamber of a hydrocarbon motor. At the present time, and just so long as the float-feed type of carbureter is used, the specific gravity of the fuel must be considered on the ground that the level of the float depends upon that very property of fuel.

There are those who say it matters very little if the fuel stands high or low in the nozzle, since it will be sucked out anyway, and in a small degree they are justified in their belief, but it does matter if the fuel runs out of the nozzle and "floods" the carbureter. It counts primarily because it upsets the even tenor of the mixture, and it wastes fuel. The float can be set for any gravity of fuel, but it is not easy to change it from day to day, or even on rare occasions, to suit the vagaries of the fuel situation. The direct injection of fuel would obviate this trouble once for all, as the injector would be dependent upon the bulk and not upon the weight of the fuel.

It is not the intention here to elaborate upon the details of design of injectors, such as might serve the purpose of forcing

liquid fuel into the combustion chamber of the motors. It will be enough to here disclose the fuel characteristics in so far as they influence the situation in favor of the direct injection of the fuel, rather than its vaporization before use. In the first place, the fuel is not vaporized in the present types of carbureters. It is sucked out of the nozzle in a stream, and is carried along in the path of the air current, subdividing as it passes along and reaching the combustion chamber in small globules, with perhaps some vaporization of the more volatile products of the composition, while the less volatile portions hold to the globule formation with a good deal of tenacity.

Use of the Suction Process

Indeed, the suction process guarantees that the spraying phenomenon so much desired will not be realized, for that condition is peculiar in forcing a liquid not aspiring it. The extent to which the globules will hold to their form will depend upon the length of the intake, the pressure, temperature and time. The time is short in practice, the impelling force is barely adequate to set up the motion, and the temperature is low.

All the conditions to be found are such as to assure the practical absence of complete vaporization. In some designs this ideal is more nearly realized than in others. The temperature of the intake is low, for the reason that liquids in changing to the gaseous state act as refrigerants. Considering the three states of aggregation of all elements and compounds, solid, liquid and gas, it must be considered that a heat exchange attends the transformation of such elements and compounds as can be changed from one to the other of the three states. Refrigerants, as the term is generally understood, are compounds, such as ammonia, carbonic acid, sulphur dioxide, etc., in which the heat exchange is attended by a considerable lowering of the sensible temperature as the liquid compound is evaporated into the gas formation. The temperature of ebullition in the case of refrigerants must at atmospheric pressure be the temperature of the surroundings, just as it is with the more volatile hydrocarbon products. Gasoline is not commercially valuable as a refrigerant for the reasons given, but it is a refrigerant nevertheless, as evidenced by the lowering of the temperature in the intake.

In mixing gasoline with air the process involves the evaporation of the gasoline; it must be deprived of its latent heat. This is not merely a matter of mingling the gasoline with the air, since the latent heat must be abstracted from the gasoline by the air before the liquid will change to the gaseous form. This takes time, of which but little is available in the interval between leaving the nozzle and entering the combustion chamber. The specific heat of air is low, and as a result the globule of gasoline must come in contact with many volumes of air before the

specific capacity of the air will equal the latent heat value of the liquid gasoline. All these and other conditions tend to thwart the good intentions of designers.

Evaporation Proportional to Surface

One other point to be emphasized is that gasoline as it is sucked out of the nozzle of the carbureter, made up, as it is, of hydrocarbons of differing values, from the point of view of weight and volatility, will hold to the globular form with greater or less tenacity, depending upon whether conditions are pronouncedly one way or the other. It should be noted that doubling the diameter of these globules increases their surface four times, but their bulk will be increased eight times. Evaporation is proportional to the surface, but if double the quantity resides under a given surface, double the time must be taken to gasify the liquid, subject to a correction in that the spheroids are reducing in diameter as the vapor expands.

There is no better way to find out the difference as between the nozzle performance under a vacuum and the performance of the same nozzle if pressure be applied than to watch the nozzle in a carbureter during the operation of a motor, and as against this put pressure on the same nozzle by any suitable means. With the vacuum it is a stream; with the pressure it is a spray—that is, provided the nozzle is suitably shaped. An ordinary gasoline torch has more carbureter philosophy in its humble makeup than can be found in most special devices costing overmuch and intended to prove out some theory.

With the torch it is easy enough to observe that liquid will survive the flame. All that is necessary to do to show this is to shoot the flame at some obstruction in juxtaposition. The liquid will be sprayed against the surface and the flame will not capture all of it.

The reason is, as before stated, that the latent heat of the fuel cannot be abstracted by air quickly enough to vaporize the liquid fuel, partially because the air is of low specific heat, and, again, because of the law of the sphere, in which, as before stated, eight times the volume can hide under four times the surface, if the globules be doubled in diameter.

Thus far the treatment of this subject has been, comparatively speaking, superficial, in that the future prospects are to be influenced by other and very material considerations. Hydrocarbon liquid fuels up to now have been comparatively low in cost and much more uniform in point of volatility than can be hoped for in the future. The specific gravity has been more uniform than it will be in the future. The divergence of the components in the fractional distilling process will be extended, in all probability. In other words, the limiting temperatures between which motor car gasoline will be tapped off will be wider; the product will include more of the components of the hydrocarbons. In the torch test more will shoot through the flame and land on the obstruction without taking fire at all.

This increase may be charged to a phenomenon in connection with hydrocarbon fuels that has ever been present, to at least some extent, at any rate. The time required for evaporation is not the same with all the compounds in the makeup of the fuel, and the inflammability is influenced differently with a given air dilution for the several compounds.

Some Compounds Ignite Readily

If, then, the several compounds are intermingled indiscriminately, it will be found that some of them will ignite readily, others with some difficulty, and more with considerably increased difficulty. The torch will show this, since the compounds that will not ignite readily will shoot through the flame and be impinged on the surface of the obstruction. Within the era of fairly uniform hydrocarbon fuels stratification was merely suspected. When the compounds entering the fuel are widely divergent there will be more than a suspicion of the presence of this undesirable phenomenon.

In the chapter on "Available Fuel for Motor Cars," to appear later, the time constants of the compounds in the hydrocarbons will be given a measure of attention. Here it will be enough to point out that the direct injection of fuel is not attended by the troubles so characteristic of the carbureter, for the reason that the fuel is positively pumped into the combustion chamber. There may be troubles of quite another sort to be expected, in view of the fact that nothing of moment will be entirely free from complication of some sort; there would be no place in the world for engineers without it.

In the direct injection of fuel it is apparently necessary to time the injection and carefully measure the weight of the fuel injected, in view of the quantity of air admitted. It must be borne in mind, as well, that the completeness of the combustion will be a measure of the relation of the injector or pump to the air valve. The quick and complete combustion of the fuel cannot be effected with what may be termed "the right amount of air." There must be an access, and unfortunately the magnitude of the excess is variable, depending upon the compounds in the fuel, their relative proportions, and the compression, assuming that the spark is properly timed. The time constant of the flame propagation is not the same for the sev-

eral compounds entering into the hydrocarbon fuel. Were but one compound used, the time would only change with the richness of the fuel and the degree of compression, assuming a corresponding temperature due to compression.

The structural problems then will be difficult of solution if the results are to be better than those realized in the cases involving correctly designed float-feed types of carbureters. It will be extremely difficult to fix the relation of the injector to the air valve; regulation for load changes will be equally a problem, and harmonizing for speed changes will be something to ponder over as well. That the direct injection of fuel will prove to be impossible is a matter that will not need second thought, for the simple reason that it is an accomplished fact and has been for several years. None of the fuel problems can now be regarded in other than the light of refinements.

"Explosive Mixture" a Misnomer

The great question of the future is one of high-weight efficiency of the motor and high-fuel efficiency, to be realized by properly supplying the fuel in conjunction with an adequate supply of atmospheric air or diluted oxygen. Indeed, it will probably never be possible to consider the use of pure oxygen in this work. Pure oxygen costs overmuch, and to add it directly to the fuel would be attended with danger, since the mixture then partakes of the characteristics of what may be properly termed an explosive. It is not uncommon to hear the mixture used in the internal combustion motor called an explosive mixture, but it is not properly such. Explosives are possessed of the elements necessary to their complete combustion in the absence of any outside supply of oxygen, and the rate of flame propagation is high in comparison with motor fuels. The piston of a motor cannot travel fast enough to get out of the way of an explosive mixture. This the author found out in a manner that might be termed emphatic, when some years ago it became fashionable to use B. B. Du Pont powder in a cartridge inserted in a breech-lock mechanism fixed to the combustion chamber for starting, to obviate cranking, especially the larger sizes so difficult to get in motion when cold.

The scheme worked very well except in the hands of men who did not care to go through the operation twice, which became necessary on very cold mornings, when the crankcase oil was of the consistency of molasses. On such occasions it was not uncommon to catch such men in the act of throwing a handful of powder into the chamber before inserting the cartridge. The plan was abandoned after a few disruptions, and especially upon being able to procure an indicator that would give a card of the curve of pressure that the blasting powder developed. Apropos of oxygen, some fuel mixtures have this element in their composition,

and in consequence are somewhat more lively in their flame-propagating characteristics.

Fuel is relatively quick burning, but it is not an explosive in the sense that gunpowder is. Unfortunately, the fuels we are able to procure are mere mechanical mixtures of several distinct compounds of carbon and hydrogen—in the main—and each compound has its own time constant.

Bearing in mind the fact that the injector, to be as nearly perfect as possible, will have to be so designed as to supply fuel at the right time and in the right proportion, it will be necessary to discuss one more phase of the subject, a phase, in fact, beyond the pale of carbureters of the float-feed or any other known type, as they exist at the present time.

Fuels in the three states of aggregation will range as follows: A—In the gaseous state they occupy the maximum space for a given mass; B, in the liquid state the bulk is a minimum, differing but slightly in this respect from fuel in the solid state; C, fuel in the solid state is nearly of the same bulk per pound as the liquid fuel, but the solid fuel is in more acceptable form in some respects, in that it will not evaporate, nor will it form an explosive until melted and combined with air, or oxygen.

Solid Fuel Considered

Solid fuel would be very troublesome in connection with present types of carbureters, and it is the positive pump or injector that would seem to lend itself to the purpose, if we are to consider solid fuel. The latter is probably best represented by naphthalene, which is one of the aromatic hydrocarbons, and is an extract from coal tar. In naphthalene we have the nearest approach to the direct utilization of coal in the internal combustion motor. The cost of production should be very low.

It would seem to be unnecessary to point out that all the other products of the process involving the production of naphthalene from coal have a stable market, and there would be no overproduction of the one or the other were naphthalene used in vast quantities in motor car motors. It is not too much to say that this fuel would quickly take the place of gasoline, at a third or less cost, were its satisfactory utilization a settled matter. The direct injection process is what holds forth the most promise in this connection, since to melt the solid fuel would be easy enough were it not for the fact that present types of carbureters demand a constant viscosity of the liquid, which could not be assured in the use of solid fuel, since maintaining a constant temperature would be very difficult.

Considering the direct injection of the fuel, it would not matter so much if the fuel were very hot or quite viscous—within limits—since the positive injection of fixed quantities would satisfy the demands; at all events, more nearly than the carbureter handles the liquid fuel of the present time. Naphthalene is especially suited to the positive injection process because of its characteristics, as high vapor tention is pronounced. If a "fog"—very fine spray—is the ideal form of the fuel as it enters the combustion chamber, high vapor tension is the phenomenon that will assure the result.

The mixture of air with this hydrocarbon is readily ignited, according to the reports of those who have used the fuel, and the residue is not troublesome, as might be supposed in view of the high carbon content.

"Sooting" is not a feature, as it seems; nor do the polished surfaces of the cylinders show any deterioration as the result of the use of this fuel. In conclusion, then, it is plain to be seen that the direct injection of fuel offers possibilities, not only by way of a remedy for present defects, but by way of the use of a far cheaper fuel possible of supply in unlimited quantities.

Releveling the Radiator

In leveling up any radiator which has a four-point support extreme care should be taken to see that it has a fair bearing at all points, otherwise when the holding down bolts are drawn tight the base of the radiator will be sprung before it finds a bearing, and an early job of soldering will be required. It is much the best plan not to draw the holding down bolts extremely tight, but to rely on the top connection or on a brace rod provided for that purpose to keep the top of the radiator from swelling. Frequently the short connection from the radiator to the engine will steady the radiator sufficiently. If it does not a brass rod may be applied between the radiator and the dashboard if the latter be sufficiently stiff. If it is not the brass rod may be run to the top of the engine. In either case a light rod 5-16 or ⅜ inch in diameter will be sufficient. Where it connects to the radiator it should be distributed over as large a surface as possible. Usually by soldering the plate to the back of the radiator at the top or by soldering a ⅛-inch brass strip, 6 or 7 inches long, under the back flange. At the top of the radiator and formed on pressing, a T about 3 inches long at the front end of the brass rod by which it may be bolted to the brass strip. An easy homemade job is to use a 3-32 by ⅝-inch steel strap instead of a round rod and rivet a triangle at its front end instead of the T just mentioned. The triangle should be broad enough to take three or four ¼-inch machine screws.

Motor Car Shop Kinks

CARE ON SPROCKET CHAINS

IT is rather common, especially in cars with planetary gear chain transmission, to see the sprocket chains drenched with oil and thickly covered with dirt. The oil itself is naturally not objectionable, but the dirt draws the oil as fast as it gathers, and, since the oil causes it to cling, it abrades the teeth of the sprocket wheels. It must be admitted that the proper treatment of sprocket chains is less easy than slushing them with oil. As outlined by the chain makers and motor car manufacturers, it is to detach the chain, say once in 500 miles—oftener would be better—soak it for several hours in kerosene and wipe as clean as possible; then boil it in mutton tallow to which a liberal supply of graphite has been added. When the chain is taken out after the tallow has had ample time to enter every crevice, it is wiped as clean as possible, so that it will not catch the dust more than can be helped. It is then brushed clean at the end of every day's run. The brushing process calls for a jack, but if the right kind of a brush is used it need not take more than a few moments. A convenient brush may be made by wiring three bicycle chain brushes side by side.

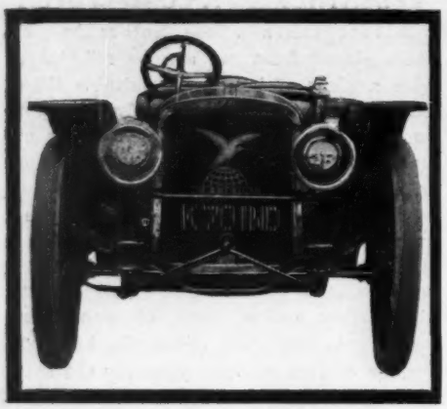
STRANGE NOISE AND ITS CAUSE

A curious incident which lately befell the owner of a small four-cylinder touring car may be of interest to others. He had bought his car—a high-grade one—at second-hand after 3 years of service, and had personally overhauled it and put it in satisfactory condition. The engine had been found to be in good order, but as a precaution the gears, which were separately enclosed in an aluminum housing at the front of the engine, were exposed and examined. The engine was oiled by splash with two feeds to the crankcase and one to the governor case—enclosing the gears—from a combination mechanical and sight-feed oiler. The oiler frequently failed to pump, and the crankcase was then fed by a hand pump, and melted grease and oil was injected occasionally into the governor case by disconnecting the oil pipe. One day while the owner was visiting friends some miles from his home an ominous noise developed about the engine. It came and went in pulsations, which became more pronounced when the throttle was opened; and it was neither a grind nor a scrape, though it strongly suggested both. It seemed to come from the front part of the engine, and the fan and fan shaft ball bearings were investigated without result. The power did not seem to be affected, and the only conjecture the owner could make was that one of the gears he had recently examined had slipped endwise on its shaft and was grinding away at the aluminum casing. There was no immediate opportunity to examine the gears, and a 40-mile spin was taken with the friends aforesaid. Before the 40 miles were over the noise had become almost continuous and was alarmingly increased in volume; and the owner drew a long breath of relief when the ride had ended without sudden casualty. On depositing his friends he took the car at once to a garage, and, aided by a helper, dismounted the headlights, front mud guards, radiator and radiator cradle in order to gain access to the plate covering the gears. To remove the cradle from the frame it was necessary to slacken the two lateral bolts holding the front side arms of the crankcase to the side members of the frame. This permitted the frame members to be sprung apart sufficiently to release the cradle. At this point it was discovered that the left-hand front engine-to-frame bolt was already loose. The space inside the channel was filled by an aluminum casting which met the crankcase arm. The reaction from the explosions produced a lifting action at this point which overcame the weight of the engine, and the aluminum casting was itself free to shake. It was instantly suspected that here was the cause for the noise. Nevertheless, the gears were exposed and examined to make assurance doubly sure, and, as anticipated, they were found in perfect condition. On reassembling the parts with the bolts properly tightened, the noise was banished. If the true origin of it had been suspected at the outset it could have been corrected in 3 minutes. It must not be inferred from this that a loose engine-to-frame bolt will always result in such disquieting symptoms as those just described. If the aluminum casting had been a snug fit in the frame most of the noise would have been prevented, and the bolt might have broken off before the much less audible thumping of the crankcase arm on the frame had been traced to its real cause. Cases have been reported of small two-cylinder engines, suspended crosswise at the front of the car, shearing their frame bolts nearly through or breaking them off entirely before the owner suspected anything wrong. After long tests nuts holding these bolts in place have been discovered quite loose.

RELEATHERING A CONE CLUTCH

A cone clutch whose leather has become glazed from use can be releathered with a piece of belting of suitable thickness and cut to shape. The first thing to do is to measure the thickness of the old leather to the nearest thirty-second of an inch, taking the leather off for this purpose. The new leather is not likely required to be more than 1-32 of an inch thicker than the old leather, since the wear is very slight. Straighten out the old leather on a sheet of paper and measure to see what width the belt will furnish a piece of approximately the same curvature. Since the leather will stretch slightly it is not essential that the pattern of the old piece should be followed absolutely. On the other hand, if the new piece is too straight it will bulge on its smaller diameter between the rivets and will not fully release when the pedal is depressed. The new piece of belting should be carefully selected for uniform thickness throughout. The new leather is cut from it about ¼ inch short, and is punched and countersunk at the ends for the rivets. It is then soaked in water for 3 or 4 hours, causing it to swell and soften. Meanwhile a cup-pointed rivet punch is procured, also a short square ended rod small enough to bear against the rivet heads when they are countersunk in the leather. When the leather has finished soaking it must be applied to the clutch before it has time to dry, else its shrinkage renders it unmanageable. First one end is riveted in place, using two rivets, and the other end is brought around and temporarily held in position by rivets or wire nails. Then the opposite portion of the strip—half way between the ends—is stretched into place and marked and punched for the middle rivet. A wire nail is stuck through to hold it, and the remaining rivet holes are located and punched in the same manner. When all have been punched they are countersunk, using preferably a flat pointed countersink made for the purpose, though a sharp pocket knife will answer. The rivet heads should be at least 1-32 inch below the surface of the leather. The leather is now riveted fast, following the same order of procedure as in locating the holes. In case the work takes longer than ½ hour it will be well to keep the leather wet, particularly if difficulty is experienced in stretching it sufficiently. On drying the leather will grip the clutch cone very tight. When dry it should be given a thorough soaking with neatsfoot oil, and the oil treatment should be repeated whenever the clutch gives signs of gripping too harshly. This work should be done when needed, it being bad practice for car users to put it off from time to time.

Motor Car Development



FRONT VIEW AMERICAN TRAVELLER

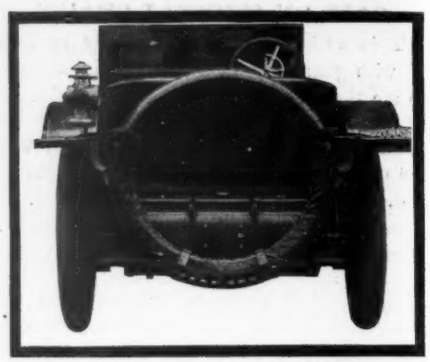
1909 AMERICANS

TO build seven models in touring car and roadster lines, each fitted with a 50-horsepower motor, but differing in body and other minor details, is the program of the American Motor Car Co., Indianapolis, Ind., for the approaching season. This program shows a unifying of effort, as compared with the present season, in which two styles of motor have been used, one with a 40-horsepower rating and the other with a 50. The characteristic American roadster with its underslung frame is continued with certain improvements which are looked upon to greatly increase its prestige, while the different models of touring cars bear striking resemblance to this year's product and carry their quota of refinements, as well as those advantages accruing from the use of high grade steels.

It is in the roadster, however, that some of the important changes appear. Foremost in this category is the employment of 40-inch wheels, in place of the 36-inch size heretofore used. Adding 4 inches to the diameter of the wheels, in conjunction with raising the wheelbase from 112 to 122 inches, is looked upon vastly to increase the riding facilities of this car, as well as augmenting its speed qualities, it having in tests shown 75 miles per hour with full equipment and passengers. Using the 40-inch wheels gives it a clearance of 12½ inches beneath the horizontal mud-apron, which extends from the radiator to the rear of the body. This car has been christened the "American Traveler."

American tourist cars are built in five and seven-passenger styles, the five-passenger type carrying a single rumble seat, which, in reality, brings it into the six-passenger class. The tourist cars carry quite a few different constructions when compared with the roadsters. The roadster employs a superframe, to which is attached the motor, transmission and steering gear; the tourist frame construction supports the motor and gearbox direct on the side member of the frame and has these members raised 2½ inches in front of the rear axle to increase the range of the rear spring action. Semi-elliptic springs are employed regularly on the roadster type, whereas on the tourists semi-elliptics are used in front and a platform suspension in the rear. The roadster carries its mechanical lubricator on the dash; the tourist has a similar oiler carried beneath the front footboards. Added to these noticeable changes are differences in radiator design, difference in steering column inclination, different location of control levers and parts, and a pressure gasoline feed system in the roadster, whereas a gravity feed system from a tank under the dash is used in the tourist types.

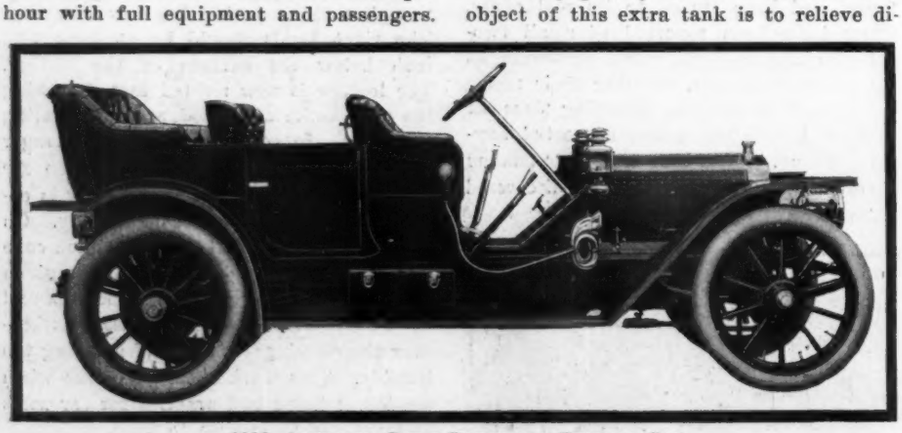
An interesting feature of the pressure feed in the roadster is that the gasoline from the 22-gallon tank carried on the rear of the chassis is forced by exhaust pressure to a 1-gallon tank located higher than the carbureter and in which tank is a regulating float, which controls the entrance of gasoline from the main tank. From this auxiliary tank the fuel feed is by gravity to the carbureter. The object of this extra tank is to relieve directly the carbureter from feed by the exhaust pressure. It is claimed that, where exhaust pressure feeds the gasoline direct to the carbureter, when the float sinks, opening the needle valve and allowing extra gasoline to enter the float chamber, this gasoline is injected in a stream, which the weight of the float is incapable of immediately counteracting at the correct moment it should—with the result that the float chamber is fuller than it should be and there is danger of an overflow into the carbureter at the spray nozzle. With gravity feed from a small tank, the pressure on the carbureter is not so great, and consequently the danger of interfering with the nicety of float control is diminished.



REAR VIEW AMERICAN TRAVELLER

The motor in all seven models is a conventional design employing four cylinders cast in pairs, each of the twin gray iron castings having an integral valve compartment on the right side in the bottom of which are contained, side by side, the nickel steel intake and exhaust valves. These cylinder castings are supported on a two-part crankcase, the upper part being the supporting member for the crankshaft as well as taking the support of the motor on the frame, thereby limiting the functions of the lower half to that of an oil reservoir. Care is bestowed on the machining of the cylinders, each cylinder casting, after the first rough boring, being annealed to remove stresses which may exist in the casting, after which it is left to age before taking the final grinding. Each of the four pistons comes in for similar treatment, and, to retain the motor compression to the highest degree, a special grade of metal is employed for the piston rings, which is claimed not to lose its elasticity when subjected to heat.

Considerable stress is placed upon the offsetting of the crankshaft. For the benefit of the amateur motorist a word of explanation is given: In the regular motor the crankshaft is directly beneath the center of the cylinder bore, but in the

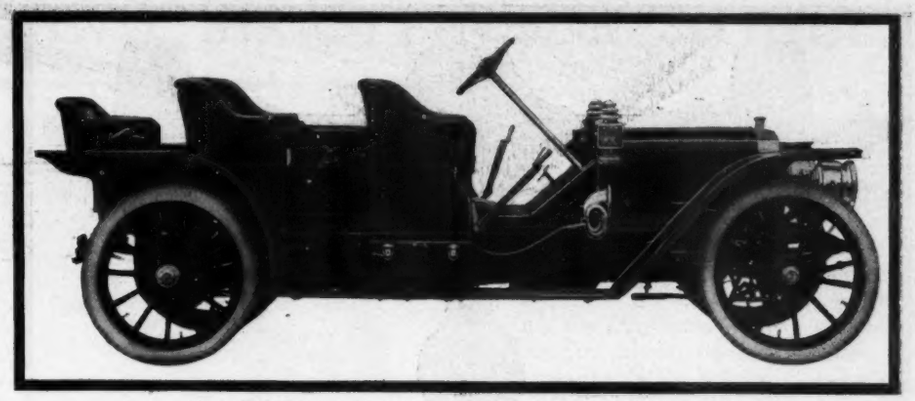


1909 AMERICAN SEVEN-PASSENGER TOURING CAR

offset shaft it is placed nearer the left side, the reason of this being that on the explosion stroke the connecting rod has less angularity than if the crankshaft were located in the center. This diminishing of the connecting rod angularity reduces the pressure on the side of the cylinder during the explosion stroke, which should result in an increase in power, a diminution of the wear on the piston rings and a reduction of the vibration in the motor. With the offset crankshaft, while the angularity of the connecting rod on the explosion and suction strokes is lessened, it is true it is increased on the compression and exhaust strokes, in both of which, however, the work done is small in comparison with that of the explosion stroke. Connecting rods are special alloyed steel forgings, built in "H" sections, carrying hardened bronze bushings in their upper ends, where they attach to the wrist pins, and having at the lower ends the usual marine construction with a cap secured by double-nutted bolts and split pins. Lastly, and most important, of the moving parts of the motor, comes the forged crankshaft made from a solid billet of steel, after which it is heat-treated and machined to balance. Freedom from vibration is aimed at by finishing the bearings to accuracy with a grinding process. In attaching the different gears to the camshaft, as well as the other motor shafts, the use of a flange on the shaft to which the gear bolts, is resorted to. All of these gears are carefully housed and operate in oil.

In manufacturing the cylinder castings, the large aluminum plate acting as a lid or cover to the waterjacket in each twin casting is made use of, the claimed advantages of such construction being the certainty of removing all core sand in the foundry, as well as the increased facilities offered for cleaning the jacket spaces when such becomes necessary.

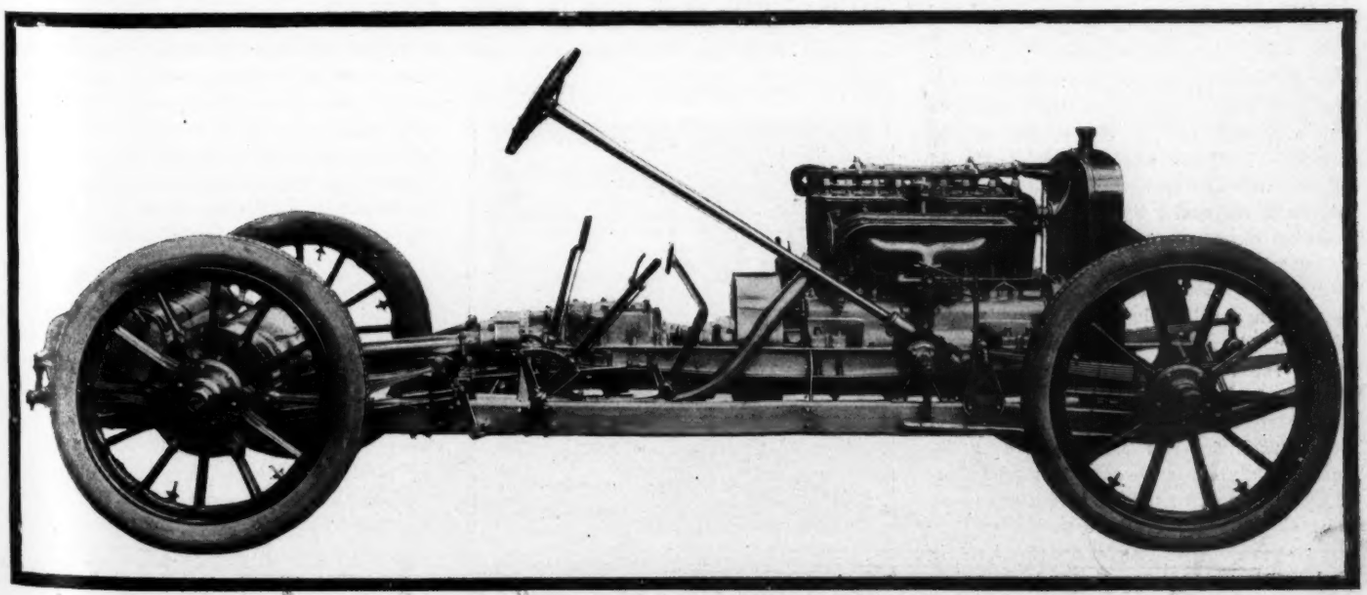
Viewed exteriorly, the motor is a well-balanced unit, in spite of its design calling for the location of both sets of valves on the right side. Grouped on the right are the valves, the carbureter, the timer for one set of ignition and the intake and exhaust manifolds; on the other side a casual inspection reveals the Bosch high-tension magneto and the centrifugal water pump, the pulley on the end of the pump and magneto shaft for driving the fan, and, in the roadster motor, to these must be added the gravity feed gasoline tank carried opposite the space between the cylinder castings. In order to avoid puncturing the half-time gear housing, the fan pulley on the pump shaft is located in the rear of this housing.



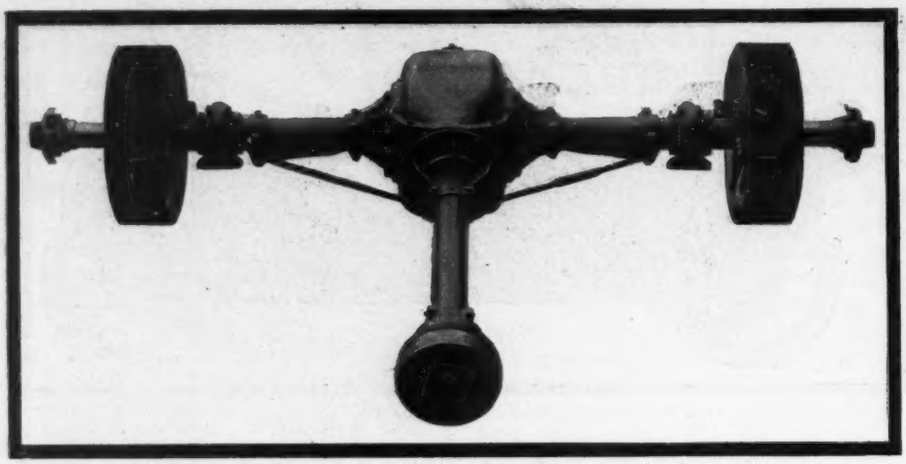
FIVE-PASSENGER AMERICAN TOURIST WITH RUMBLE SEAT

Intake and exhaust valves, made interchangeable, and operated from the same camshaft, have the push rods and rollers hardened, and the push rod guides are secured in the crankcase by a four-arm yoke with center bolt; one yoke securing the guides for the intake and exhaust valves for each cylinder. The upper ends of the valve push rods are threaded to take an adjusting and lock nut for valve timing. The intake manifold is a one-piece casting made with easy curves, and the exhaust manifold—a large-sized malleable iron casting—is of the horizontal one-piece type and is ribbed to increase strength. Locating the intake manifold below and closer to the cylinders than the exhaust manifold has the advantage of tending to prevent the condensation of the mixture en route from the carbureter to the cylinder.

Ignition is by two independent sets, the main one a Bosch high-tension magneto which incorporates within itself the means for high-tensioning the current, the interrupting parts and the distributing means. With a system of this nature, coils carried on the dash or beneath the car seats are done away with, and distributers or commutators on the engine are eliminated. Wiring is reduced to a minimum. The supplementary or reserve system is a storage cell, the low-tension current from which is high-tensioned through a four-unit dash coil and delivered to the spark plugs through a roller type commutator carried on the top of a stationary aluminum housing on the right side of the motor between the front and rear cylinder castings. The vertical shaft carrying the timer takes its drive from the camshaft through helical gears, and, in advancing or retarding the spark, the commutator part carrying the wires remains stationary, the advance or retard



SIDE VIEW OF 1909 AMERICAN TRAVELLER WITH ITS UNDERSLUNG FRAME DESIGN



AMERICAN REAR AXLE AND TORSION TUBE HOUSING DRIVE SHAFT

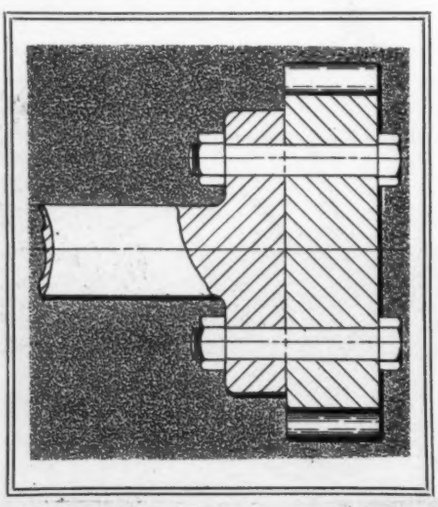
being accomplished by changing the relation between the gear on the camshaft and that on the timer shaft. The wiring is run through fiber tubing and the terminals on the spark plugs are designed so they can be removed from the engine when it is in operation without danger of a shock. These terminals may be replaced without the use of tools.

The lubrication of each model calls for a six-speed mechanical lubricator, four of the leads of which connect with the cylinder walls on the left side and the other two with the crankshaft bearings.

In the cooling system the centrifugal pump located centrally on the left has a double intake used to increase its capacity and in keeping with this is the employment of large diameter pipes. The method of circulation is from the pump to the jackets immediately beneath the exhaust valve, this being the hottest part of the engine. The exit is from the cylinder heads, the pipe therefrom branching in "T" form to the upper sides of the radiator. The radiators employed in both tourist and roadster types are of the vertical copper tube variety, with 5½-gallon capacity in each, although, to the casual observer, that of the roadster appears the larger. It is larger in square inches of front surface, which, however, is overcome by making the radiator on the roadster with a 3½ inch depth from front to rear, whereas that of the tourist is 4½ inches. In both radiators the vertical copper tubes are narrow and the radiating quality is increased by the addition of a piece of sheet copper, from which there are punched small corrugated fins, which corrugations attach to the tubes by immersion in a solder bath. With this construction all seams in the copper tubes are on the front and back surfaces, permitting of repairing a leak by the use of the soldering iron. In addition to these cooling facilities is the presence of a 16-inch cast aluminum fan, supported on an arm from the front cylinder and driven by a 1-inch flat belt from a pulley on the pump shaft. Adjustment of the belt is by loosening a cap screw and swinging the support on its journal. The fan blade construction of the fly wheel assists in the cooling work.

As a starter in the transmission system is the leather-faced cone clutch engaged by a spiral spring made from stock ¼ inch by 1 inch. The thrust from this spring is self-contained and is taken on a ball thrust bearing which is encased and lubricated by a compression grease cup. In the disengagement of the clutch, the strength of the spring is overcome by making the clutch pedal leverage a nine-to-one leverage, so that the force on the pedal is one-ninth that of the strength of the spring. Between this clutch and the selective gear clutch is a universal coupling in which the square ends of the coupled shaft engage with square driving heads, which couplings are made in halves and divided longitudinally, so they may be uncoupled by removing the bolts which hold the halves together. This coupling allows of removing either the clutch or the transmission without interfering with the other.

The gearset, a standard speed change construction, offers four forward variations with direct on the high, and has a reverse construction in which the gear revolves only when in use. Chrome nickel steel is employed in all gears, the shafts are of special alloy steel and are carried on nickel steel ball bearings. The shaft



AMERICAN GEARS ATTACH TO THE SHAFTS BY BOLTING TO FLANGES

which carries the sliding gears has four splines, milled on it and distributed at 90-degree intervals, a construction which eliminates keys and other parts not integral with the shaft.

Drive from the gear shafts is through a propeller shaft with universal to a floating rear axle on the ends of the drive shafts, of which are claw clutches for engagement with corresponding ones on the wheel hubs. A tubular torsion rod completely encases the propeller shaft, and at the front end of it is a universal joint support carried on a bracket or cross member of the frame, which acts as the support for the rear end of the gearshaft. This torsion sleeve fastens by flange couplings to the differential housing. Special access is afforded to the differential because of the large cover inspection plate which covers an opening sufficiently large to remove the differential intact.

In a close scrutiny of the running gears employed on the roadster and tourist cars when a standard construction based on conventional lines appear. The touring car frames built up of two side members and three cross pieces of alloy steel have the side channel members with a maximum depth of 5 inches, a 1¾-inch web and ⅛-inch stock. The crankcase acts as a cross member at the front. The roadster frame of the same stock has the side members narrowed at the dash to increase the turning angle of the car and, as already mentioned, employs a superframe. Its side members are not raised in front of the rear axle. The crucible steel springs employed in the touring car are 42 inches in front, and the three-part platform suspension of the rear has the side members 48 inches long and the transverse member 39. In developing the rear suspension system the side members are offset on the axle so as to make the front end equal in length to the rear end plus half the length of the cross frame, which is supposed to give the same spring action as from a semi-elliptic 67½ inches long. Compression grease cups are positioned at the head of each spring bolt.

In the roadster a different spring suspension is employed because of its increased speed. Semi-elliptics 42 inches long are employed in front and rear. The spring action in this car is altered because of the underslung frame, and should the wheel strike an abnormal obstruction there is nothing to impede the upward travel but the spring tension.

The front axle, a weldless I beam nickel steel forging, in the tourist types is dropped at the spring seating 2⅞ inches below the wheel centers. Between the top of the steering knuckle and the yoke end of the axle is fitted a ball thrust bearing, which takes the weight of the car; the tie rod is threaded for adjustment purposes, and the steering arms are drop forgings of oval section. The steering gear of the worm and nut design is made with provision for adjustment; control is through a 17-inch steering wheel.

LOZIER FOUR AND SIX-CYLINDER MODELS

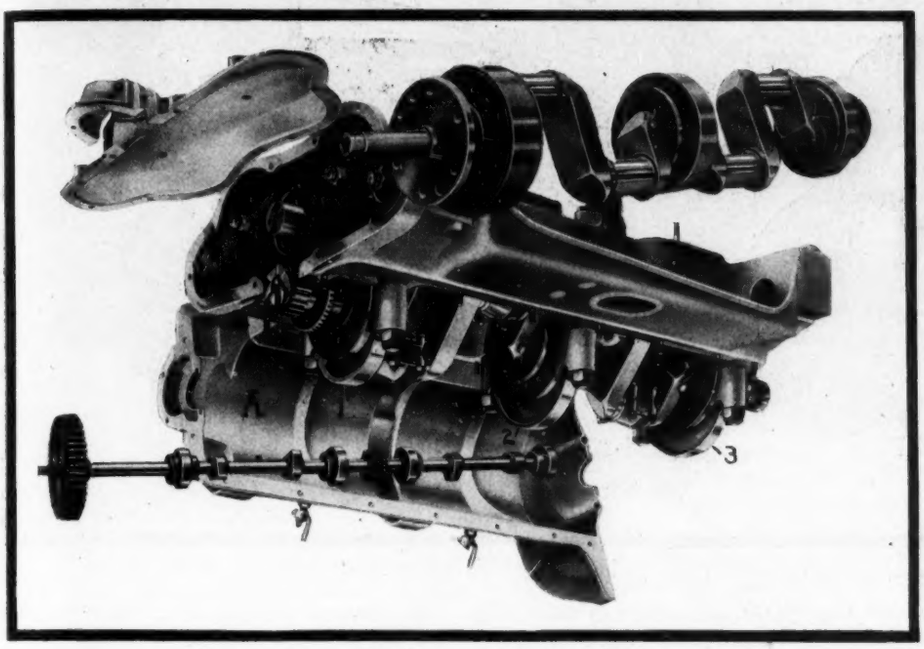


FIG. 1—LOZIER BALL-BEARING MOTOR CRANKCASE

THE coming season will mark the complete adoption of shaftdrive for all of the four and six-cylinder Lozier cars, with the exception of a few chain-driven type model E which will be disposed of. Strictly speaking, the 1909 models are two: Model H, four-cylinder, 45-horsepower, with cylinders 5¼ inches square, the car being of the five and seven-passenger type, with 124-inch wheelbase and 36 by 4 and 4½-inch tires. The other model, designated Big Six, uses cylinders 4⅝ by 5½ inches in size, rated at 51 horsepower, has a 131-inch wheelbase and makes use of 36-inch tires, with 4 and 4½-inch sizes on front and rear. The principles of construction in these models are the same and both are supplied in runabout, touring car, limousine and landaulet models. While the general Lozier characteristics of the present season are retained, yet not a few changes that will conduce to smoother running have been made. A slight alteration in the timing gears at the front of the motor has resulted in a reduction of noise; steering has been made easier by the employment of ball bearings in the top of the steering knuckles on which the weight of the car is taken. The fan is driven by spiral instead of bevel gears, and by changing the contour of the fourth speed gears of the transmission set, quieter action has been achieved. The cars are built by the Lozier Motor Co., Plattsburg, N. Y.

Both models might be termed ball-bearing chrome nickel steel products, annular ball bearings being used in the motor crankshafts, camshafts, pump and magneto shafts, as well as in the clutch, transmission, rear axle, front wheels and steering gear parts. Chrome nickel steel, specially treated and hardened, is employed for the motor shafts, the transmission shafts and gears, and the shafts and gears in the rear axle system. The hydraulic governor control, fitted to the carbureter this season, has been discontinued, complete control of the carbureter resting with a small lever on the steering wheel and the accelerator pedal.

Perhaps no phase of the motor presents greater interest than the ball bearings of the crankshaft, illustrated in Fig. 1 and designated respectively 1, 2 and 3. In the six-cylinder types four bearings are used. These bearings attach to the upper half of the crankcase, by semi-circular yokes, the bolts for retaining which pass entirely through this portion of the case. The lower half of the case A, for the benefit of splash lubrication, is divided into front and rear compartments. The camshaft is made with cams integral and is supported on four annular ball bearings. In the center of the shaft appears the spiral gear for driving the distributes. A particular symmetry permeates the motor design, this appearing in the balance of the timing gears D, Fig. 3, at the front end, which are driven direct from the crankshaft pinion and in turn by the pump and magneto gears E, on the right and left respectively. The employment of a dropped integral bed C, between the motor arms on the right and left, and the flanging of it upwards, gives a first-class support for the water pump and oiler B, on the left, and the magneto on the right front. The water pump intake F passes through this bed piece, thereby placing the entire hose connection with the radiator beneath the engine. The use of covers A for the valve spring of each cylinder casting is retained.

The enameling of the Lozier cylinder castings invariably attracts comment, the pearl gray finish being suitable for such purposes. In this enameling process, the cylinder castings are prepared by filing and finishing with emery, after which they are ready for the first coating of enamel. The first coat applied, the cylinders are put in a bake-oven, heated to 400 degrees by electric heaters, which, being free from smoke, the coloring of the enamel is not interfered with. After the first coat is baked, a second one is applied, which, after its oven treatment, is ready to receive the final coating. The use of three coats of varying natures, coupled with a separate baking of each, is claimed to be sufficient to render the enamel durable and not to be affected by heat.

The twin-cylinder castings, with opposite integral valve chambers, are made with the large cover, or top plate, for the jacket which facilitates removal of the coarse sand from the casting. Valves of nickel alloy are made interchangeable, and operated on the direct-lift plan, the springs seating at their lower end in cup lifters,

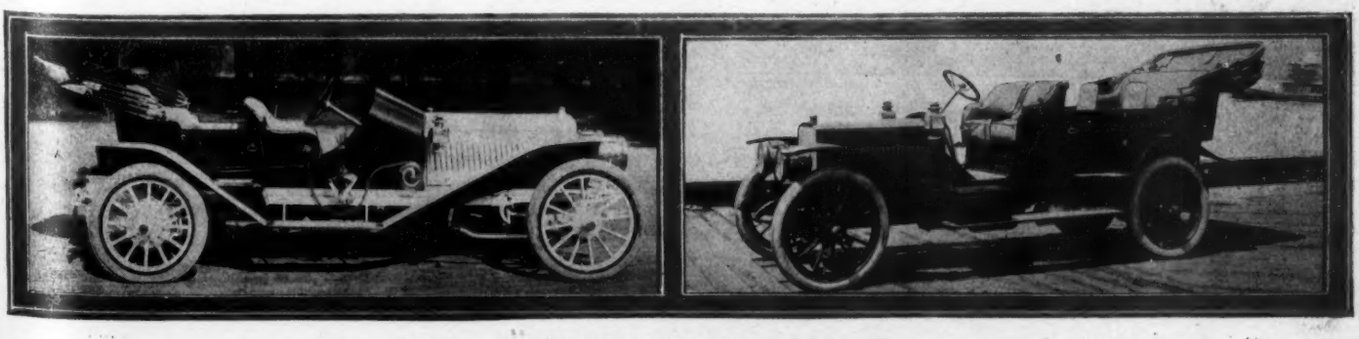


FIG. 2—A COUPLE OF 1909 LOZIER MODELS OF ROADSTER AND TOURIST LINES

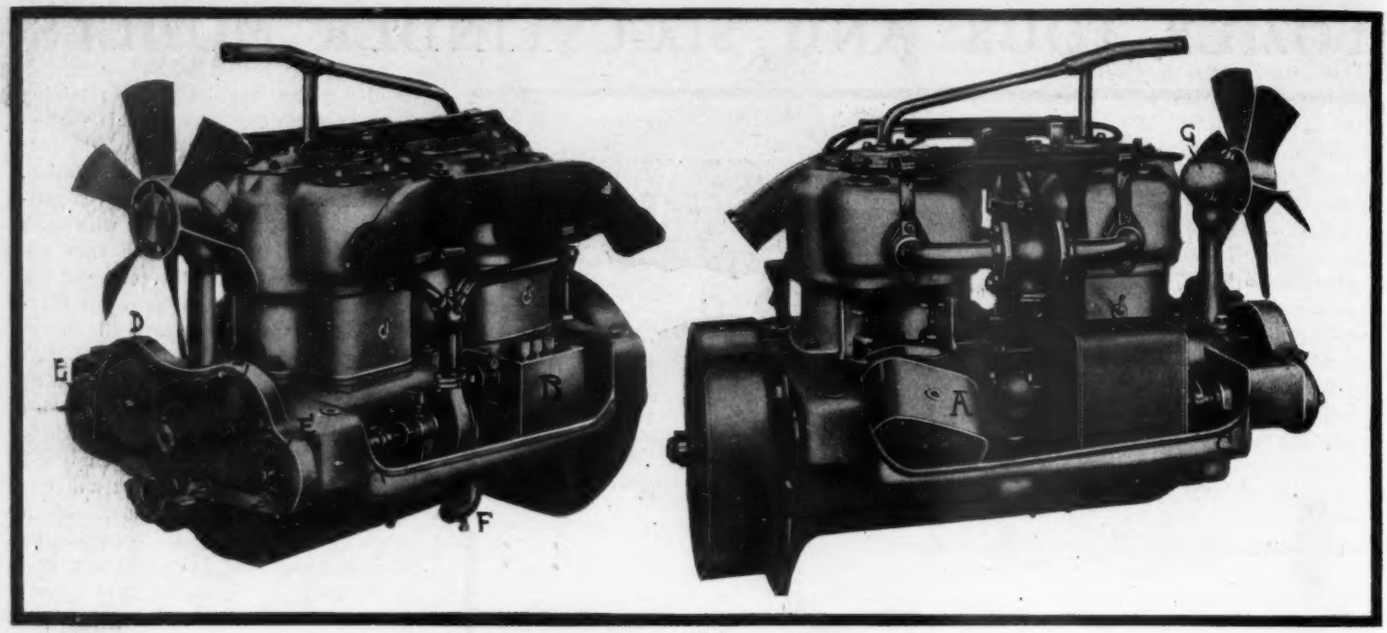


FIG. 3—LOZIER MOTOR SHOWING VALVE SPRING COVERS AND MOTOR BEDS

and the lifter-rod guides being anchored in the crankcase by crow-foot yokes with a central retaining stud. Locating the water pump, oiler and magneto low down on the motor bed plates leaves all of the valve springs particularly accessible, this being rendered additionally so because of carrying the exhaust manifold well above the ports, locating the carbureter opposite the space between the cylinder castings, and using a T intake for the water pump.

Changes in the lubrication system are entirely in the direction of simplicity, reliance being placed solely upon a splash system, considered sufficiently efficacious because of the general use of ball bearings. On the side of the chassis is carried a 3-gallon oil reservoir, which is the supply. Located between the motor base and the frame is a bank of four McCord type oil pumps, one of which takes the oil from the main reservoir, drawing it to the reservoir of pump; two other pumps deliver this direct to the front and rear compartments of the crankcase, and the fourth works through a telltale employed only to inform the driver of the operations of the oiling system. In the six-cylinder types, one extra pump is required for the third compartment of the crankcase. With this system the usual multiplicity of oil pipes, twisting around and disfiguring the motor, is done away with, a feature of motor construction rapidly becoming popular in America. Within the crankcase arrangements are made to supply the lower bearings of the connecting rods by carrying on the throws of the crankshaft U-shape oil rings which are filled from the splash and deliver the oil in them through bores in the crankshaft to the white bronze bushing at the lower end of the connecting rods. In the base of the crankcase compartments are drain taps for drawing off the oil and also gauges for the determination of the proper level.

The Lozier double ignition system is retained, the major member of this is a ball-bearing Bosch high-tension magneto with self-contained distributor, and which delivers its current to a set of plugs located above the intake valves. The secondary set is a 50-ampere-hour storage cell, the current from which is passed through a single-unit coil on the dash and delivered to a set of plugs over the exhaust valves through a high-tension distributor, located on the right side of the engine and driven from the camshaft. The distributor is supported on an aluminum standard, and the timing is such that in the advance or retard of the spark the distributor wires remain stationary.

A change in the carbureter system, to which the maker draws attention, is the discontinuance of the hydraulic governor, a controlling device used last season and at present fitted to such cars as Packard, Panhard, and Napier. The new carbureter equipment comprises a concentric float type in which the needle valve is carried in the center of the float chamber, so as to secure a uniform gasoline level on grades. To facilitate starting, a shut-off valve is fitted over the air-intake pipe, and which can be closed when cranking the motor by a pull rod extending through the radiator. The value of this valve is that it restricts the air supply, thereby increasing the pull on the gasoline in the nozzle and giving a richer mixture. In general design the carbureter is of the central air-intake type, having an auxiliary air valve. Arrangements are made whereby the needle valve is automatically opened when the motor speed in increased. The intake manifold is a two-piece affair of two opposing elbow pipes, one to each cylinder pair and which connect with a horizontal union at the top of the carbureter, the whole arrangement providing a particularly short travel for the mixture and a high location for the carbureter, the latter not interfering with the gasoline feed which is by pressure from a tank located in the rear of the chassis.

In the cooling of the motor, the characteristic Lozier copper tube radiator remains. In this radiator are 2,000 horizontal copper tubes located longitudinally of the car, the spaces between the tube containing the water. Advantages claimed for this radiator are that the tubes extending from front to rear of the radiator can be quickly cleaned, and should a leak occur it is an easy matter to plug one of the tubes with a cork.

The multiple-disk clutch carried in a

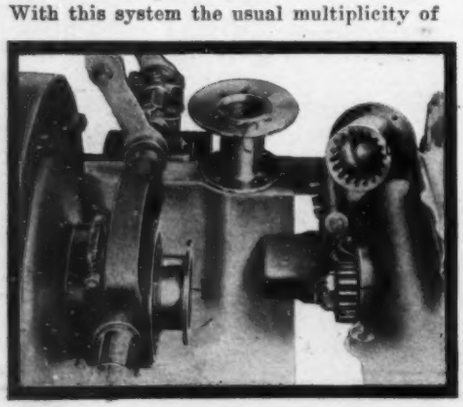


FIG. 4—CLUTCH COUPLING

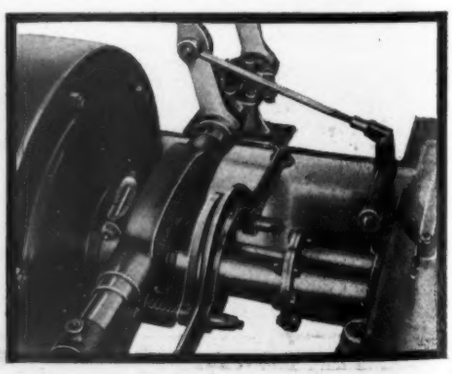


FIG. 5—CLUTCH COUPLING

tubular extension of the flywheel hub is retained, its makeup embodying thirty-three disks made of saw-blade steel. Two accompaniments of the clutch are valuable, one a brake which slows the clutch speed when changing gears, and which greatly facilitates this work; and the other an interconnection, whereby it is impossible to engage the clutch without the gears being properly meshed. Between the clutch and gearbox, and used for the second season, is a unique form of coupling, illustrated in Figs. 4 and 5, consisting of a gear A on the forward end of the transmission shaft, and an internal gear B which attaches by flanged couplings to the stub shaft D of the clutch. A sleeve C encases the joint. This gear and internal gear device allows of easy sliding for clutch engagement, and also offers a sufficient universal nature to take up any inaccuracies of alignment that might arise.

The selective gearset, employed in the four and six-cylinder models, uses the four forward speeds with direct drive on the third, which is a three-to-one ratio. The fourth speed ratio is two and one-half to one. The upper half of the gearcase carries a rectangular inspection plate with its margins slotted to take retaining bolts with winged nuts, these bolts being hinged at their lower ends to allow of swinging out of the slots in the margin of the cover without removing the wing nuts. The gears employed are chrome nickel steel, furnace-hardened, and the three shifter-rods are located in the side of the case. The previous policy of enclosing the flywheel by a casting which anchors to the rear end of the crankcase and the front of the gearbox is continued.

It is in the shaft drive that the Lozier cars show their big 1909 characteristics. The method employed in this system is that of using one universal joint, carried at the rear of the gearbox, and housing the propellor shaft in a tubing which bolts at the rear end to the differential case

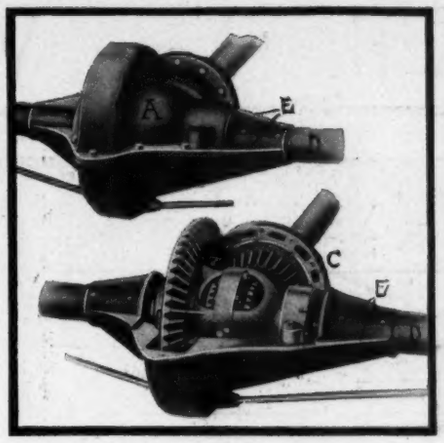


FIG. 6—LOZIER DIFFERENTIAL

on the rear axle. The forward end of this shaft housing is carried in a ball and socket support from a cross member of the frame, this support being possible by a sliding sleeve on the end of the shaft housing, which has a ball ending, to take support in the socket carried on the cross member of the frame. This housing serves as a torsion tube, but is supplemented by radius rods extending from the side members of the frame to the ends of the axle. The differential housing, illustrated in Fig. 6, consists of a lower half B with ends flanged at E to receive the axle tubes D, which are brazed and pinned in position. The cover A is of sufficient size to allow the complete removal of the differential gears. The housing has an integral portion C which acts as a retainer or ring for the ball bearing carried at the front of the bevel pinion on the driveshaft.

An analysis of the running gear shows the side members of the frame, Fig. 7, to be dropped at A to increase the action of the platform spring E; the internal and external brakes are applied through equalizers B, which operate through slots in the side members of the frame. The I-beam front axle, together with semi-elliptic springs, is continued, the steering tie rod is placed in the rear of the front axle, and the steering gear inclined at 45 degrees is of the worm and gear type.

FRENCH CAR COMPETITION

A permanently fixed course around Paris, starting from the Port Maillot, passing through Maisons-Laffitte, St. Germain and Versailles, and finishing at the point of departure, has been selected for the 8-day taxicab and light delivery vehicle competition next October. The main reasons for keeping the cars on one course for 8 consecutive days is to give an opportunity of more accurately controlling and comparing the consumption of the various fuels employed. In addition to a couple of days of gasoline, each competitor will have to cover the regulation distance on alcohol, white spirit and benzol, official observation being made of the quantity of each consumed. This should provide some valuable comparative figures on the cost of the various fuels. By starting in the early morning and finishing at the same place in the early afternoon, drivers and helpers will be able to return to their homes or business each day, a rather important consideration in view of increasing activities in the trade on the approach of the shows. Contrary to the usual plan of procedure in competitions, only one man will be allowed on each taxicab, hotel omnibus or delivery vehicle. The organizers declare that this step has been taken in order to remove the impression prevalent among business firms that two men are required to run a motor car. The plea is often put forth that mechanical traction is more costly than horse haulage, because in addition to driver and delivery man there will be required a mechanic, making three men where two are now employed. In the Paris competition all work must be done by the one man in charge of the vehicle; no outside help whatever, either on the road or in the parking stations, being allowed.

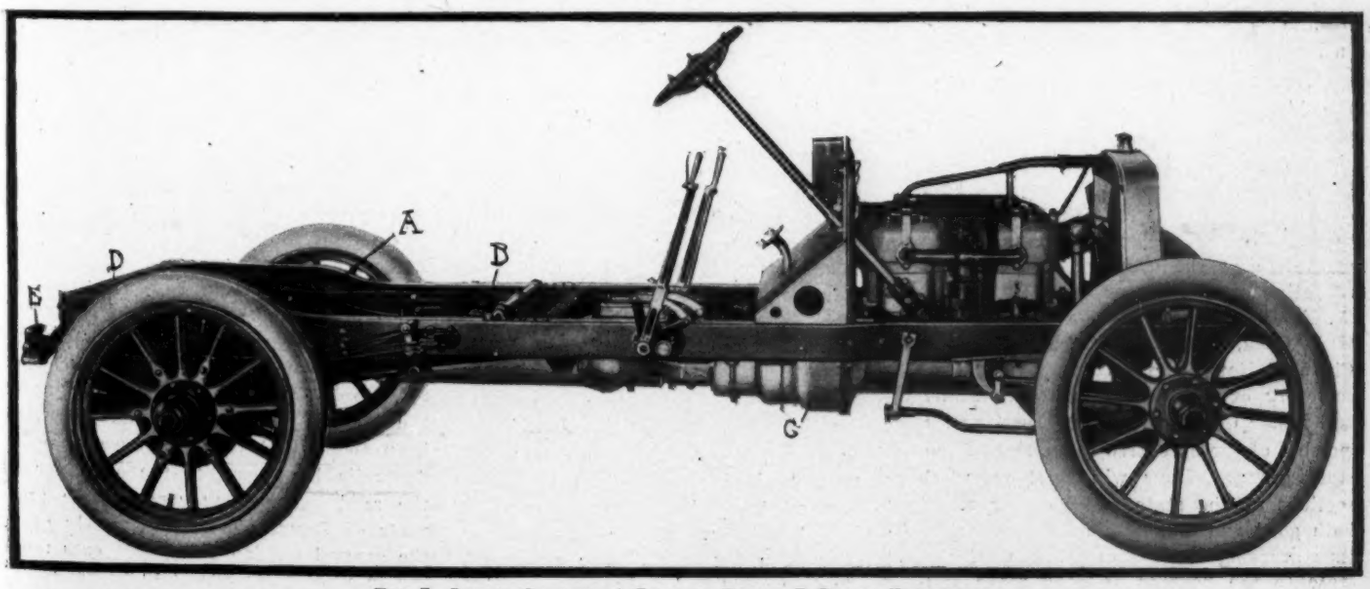
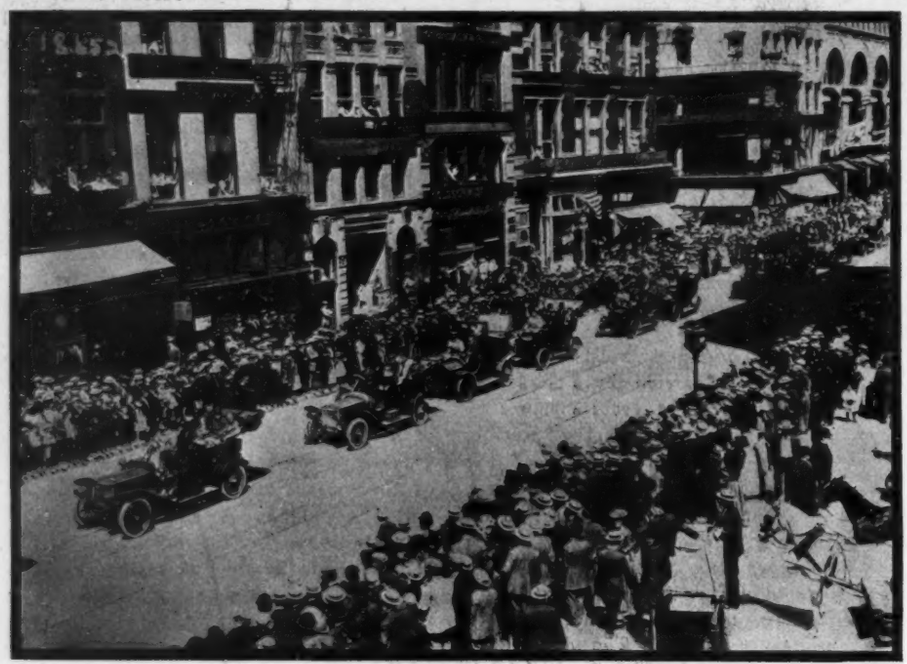


FIG. 7—LOZIER CHASSIS, A DROP IN FRAME, B BRAKE EQUALIZERS

From the Four Winds

N S E W



PROCESSION OF MOTOR CARS CARRYING OLYMPIC WINNERS IN NEW YORK PARADE

Brush Climbs Pike's Peak—A telegram from the Brush Runabout Co. announces that it has been informed by Trimkle, driver of No. 3 Brush in the company's efficiency test, that he has succeeded in climbing Pike's peak, the car going up under its own power.

Milwaukee's Orphan Outing—Forty-eight cars carried the 300 orphans of two Milwaukee asylums to Washington park on Tuesday, the occasion being the annual outing for Milwaukee orphans by the Milwaukee A. C. At 8:45 the cars lined up, took the children to the park, and at 2:45 gathered them in and gave them a ride about town. W. H. Pipkorn was chairman of arrangements and handled the outing in an able manner.

Governor Will Attend—Coöperation of the highest state official is assured the motorists and farmers for the good roads convention that will be held at Atlantic City, September 25 and 26. Governor Fort of New Jersey will make the opening address. The committee in charge of the promotion of the convention is a representative one. It is made up of George W. F. Gaunt, master of the state grange; H. B. Cook, of the Associated Automobile Clubs of New Jersey; H. A. Bonnell, ex-secretary of the New Jersey Automobile and Motor Club, and Albert Hermitage, a member of the executive committee of the state grange. Runs will start from all sections of the state and go over roads both good and bad within its boundaries, thus arousing the influential men of the state to the benefits of good roads and contrasting them with the obstacles of unimproved highways. Especial emphasis will be laid on the desirability of building continuous routes.

On Tour in Electric—Carl J. Metzger, sales manager of the Woods Motor Vehicle Co., who left Chicago August 20, reached Cedar Rapids, Ia., August 27, on his 2,000-mile tour in a Woods electric, having covered 521 miles. He reports bad roads and a good deal of sand.

More Roads Ordered—Madison county, Indiana, of which Anderson is the county seat, has under construction or contemplates the building of eighty-nine new gravel roads under the 3-mile road law. These improvements will cost about $600,000. A number of Indiana cities and towns are preparing to improve their streets under the 3-mile law, which provides for the improvement of any road that connects two improved roads, not to exceed 3 miles long, at the cost of the township.

Bay State Club Moves—The Bay State A. A., of Boston, is now located in its new quarters at the Carleton hotel. There are six rooms on the street floor and each room is a very large one. In fitting them up no expense was spared. There is a separate entrance from the street to the rooms, so members may go in without entering the main office of the hotel. The three larger rooms will comprise a restaurant, billiard room and parlor. The billiard room will be a lounging room as well, and it is arranged to represent the interior of a log cabin. The restaurant fronts on a court and makes an attractive place in which to eat. With such fine quarters it is expected that the club will attract to its fold again many of the members that have not been around for months. The Boston dealers can reach the place easily, and, as the meals will be of the best, the old-time noonday jollity should be revived.

Motor Traffic in Berlin—On June 30 of this year there were 588 taxicabs in operation in Berlin. On the same day there were 3,178 street cars in operation, which is thirty-seven fewer than on March 31 of this year. There were also 155 motor buses in operation at the end of June.

Buffalo's Big Parade—The fourth annual decorated and illuminated parade of the Automobile Club of Buffalo will take place on Thursday evening, September 10. The first car will take its place at Main and Tupper streets, facing down Main, others falling in line behind it. The start will be at 8 o'clock promptly, and line of march will be down Main street to the Terrace, encircling the Liberty Pole, countermarching up Main and into Luna park, where the cars will be judged by a number of competent judges.

Motor Cycle Hill-Climb—The initial hill-climb of the Hartford Motor Cycle Club was conducted over the Prospect avenue course under ideal weather conditions. The contest was uneventful save for the reduction in time and consequent establishment of a new record for the course. There were five events on the program, three of which were for professionals and two for club members. Gustavson, a professional, had things much his own way in every class in which he was entered and it was from start to finish an Indian scoop. The course was covered with loose stones which were hurled to the roadside by the impact of the tires.

Australian Business Good—A report from Sydney states there has been a marvelous expansion of the motor car business in Australia, it being estimated that there are at least 1,000 cars running in New South Wales alone, although only 3 or 4 years back there were not over forty. At present there are between eighty and ninety different makes on that market. Originally the French cars were most in demand, then American cars came to the front, but now the British makers have succeeded in largely capturing the market. The demand is generally ahead of the supply. There has been a decline in the sales of the cheaper cars, it having been found that they are unsuitable for Australia by reason of the character of the roads. Importers consider the prospects of future business extremely good, the general opinion being that cars ranging in price from $2,000 to $3,000 would be in most demand. It is anticipated that

the next few years will witness many thousands of cars in general use throughout Australia, now that their utility has become so widely recognized.

Cleveland Sets Dates—Cleveland has selected October 7, 8 and 9 for the reliability contest which the local club will conduct. At this time it seems probable that a triangular course will be laid out instead of the cars running in and out of the city each day, as was the case last year.

Money Raised for Roads—The good roads movement has received new impetus recently in the vicinity of Upper Sandusky, O. Bids were received this week for the sale of bonds amounting to $24,000, the proceeds to be used in piking roads in Jackson, Tiffin and Marseillies townships, and $15,000 for road work in Mifflin township. The bonds were secured by the Security Savings Bank and Trust Co., of Toledo. It is therefore certain that at least $39,000 will be expended by the county commissioners at Upper Sandusky in road building within a short time.

Two-Wheelers Show Speed—Last Saturday's meet of the Quaker City Motor Cycle Club, at Point Breeze track, while it resulted in no broken records, furnished some of the most exciting racing ever witnessed here. Indian machines of various horsepowers landed the bulk of the plunder, Stanley T. Kellogg and Walter Goerke alternating as stars. After Goerke had won the 10-mile in 12:01 2-5, nosing out Kellogg, the latter reciprocated in the 10-mile open in 10:59 3-5, the fastest race of the day, Goerke getting the place. The 25-mile open was won by Goerke in 30:21 2-5.

Rules on Tags—Considerable interest has been evinced in the larger cities of Ohio in the recent ruling of Secretary of State C. A. Thompson, in response to an inquiry from Charles J. Lauer, chief of the Columbus fire department, to the effect that all self-propelling fire apparatus is exempt from the operation of the state motor law, but that cars owned by municipalities and held for the use of officials of the fire department, even when used by them only in the performance of their official duties, must bear tags and take out licenses. A number of the larger cities are affected by the ruling.

Cars for Old Soldiers—The motor car is cutting no small figure at the national encampment of the G. A. R., which is being held at Toledo during the first week of September. Many of the finest cars in the city have been turned over to the entertainment of the old soldiers, who will be shown the interesting sights as well as the many points of interest in the immediate vicinity. The battlefield of Fallen Timbers and many other interesting spots, including the old Fort Miami, as well as the monument which was unveiled on the site of Fort Meigs during the week, were visited by thousands of visitors. Provision also had been made to furnish motor cars for all old soldiers who were unable to walk in the big parade, and to haul officials to and from important meetings during the week.

Another Badger Outing—The Milwaukee Automobile Club is planning another 2-day outing tour this season. The route under consideration is from Milwaukee to the Mississippi river and return. Since its last two successful tours, one to Wausau and the other to Manitowoc, Wis., clubs in western Wisconsin are demanding the privilege of entertaining the Milwaukee motorists.

Right Kind of a Mayor—Mayor Clark of Fond du Lac, Wis., is found at the head of the procession of fire apparatus with his big touring car at every occasion of alarm. He generally beats them all to it, even outdistancing the chief. Mayor Clark also places his car at the disposal of the city governmental departments for various purposes, such as aldermanic junkets, street inspection, etc., and the common council of Fond du Lac, as a body and individually, is a firm believer in the utility of the motor car.

Does Not Fear Oil—Good oil dropped from motor cars is not detrimental to pavements and there will be no ordinance in Milwaukee to molest owners of such, is the verdict of City Engineer Poetsch and Commissioner A. J. Grundman of the Board of Public Works. A quiet movement was on foot to introduce a resolution forcing all owners to provide aluminum or other oil pans for their machines. The board of public works, at least these two members, stood pat, and the others came to think the same way. City Engineer Poetsch said: "The oil does not hurt pavements. Why should we start curbing rights of motorists except in regard to speed? Michigan avenue in Chicago is black with oil that leaks from standing cars, and Chicago has made no such move."

Outlook in Siam—Although the importation of motor cars into Siam did not begin until the year 1904, it has already attained considerable dimensions, and at present Bangkok is looked upon as the most important place in eastern Asia for large and luxurious cars.

Another Wildwood Meet—Undaunted by the poor success which attended its last meet, the Motor Club of Wildwood is hard at work planning for its closing meet of the season of Labor day, September 7. Rain and accidents spoiled the August 1 meet, which was postponed to the 30th and run off with an abbreviated entry list and before a small crowd. The Labor day affair will bring together all the flyers in the east and it is freely predicted that the Central avenue boulevard course record of :42 3-5, held by Fiat 120, will be broken several times. The affair will be run under A. A. A. sanction.

Improving Baltimore Streets—Preparations are being completed by the commissioners for opening streets for improvements of turnpikes within the city limits of Baltimore out of the $1,000,000 to be received from the state good roads fund. The pikes to be benefited in consequence of this fund are Frederick, Belair, Harford, Reisterstown and Liberty roads, which will be acquired by the city and improved. The greatest difficulty will be the acquirement of the beds of the turnpikes which are owned or controlled by the United Railways Co. A conference between the city officials and the good roads commission will have the effect of showing just what the city may expect.

ANNUAL GATHERING OF G & J SALESMEN AT INDIANAPOLIS

First row sitting, reading from left to right.—W. B. Harding, purchasing agent; G. H. Hamilton, sales manager; H. A. Githens, general factory representative; B. D. Dowse, president; E. S. Benson, secretary and treasurer; H. W. Waite, factory superintendent; H. H. Holloway, office manager. Second row standing—H. B. Dwelle, order clerk; C. H. Mead, Portland, Ore.; W. C. Dowse, Chicago; F. A. Drake, Philadelphia, Pa.; F. Burodin, Philadelphia, Pa.; F. S. Cropley, Chicago; T. V. Graves, Chicago; D. B. Price, Boston, Mass.; Saul Levy, Buffalo, N. Y.; D. E. Foote, Cleveland, O.; G. W. Stephens, advertising manager; W. K. Philp, New York; C. L. Elyea, Atlanta, Ga.; C. E. Starratt, San Francisco, Cal.; E. H. Sprague, Omaha, Neb. Third row standing—C. S. Monson, Detroit, Mich.; G. M. West, Los Angeles, Cal.; H. G. Plant, Minneapolis, Minn.; H. H. Hubbard, Indianapolis, Ind.

Among the Makers and Dealers

New Plant Planned—The Waukesha Motor Co. of Waukesha, Wis., is completing designs for a new factory building in which it will triple its present capacity.

New Motor Buggy—A motor buggy especially designed for the use of rural mail carriers is to be manufactured by the King Motor Car Co., which has just established a factory at Auburn, Ind. Ralph King is back of the company and a car after his design is to be manufactured.

Chicago Changes—The Reo Automobile Co., of Chicago, in which are interested B. C. Buxton and Otto Owen, has taken the Reo agency, formerly held by the Walden W. Shaw Co. The new concern is located at 1220 Michigan avenue. The Cornish-Friedburg Co. has taken the Chicago agency for the Regal and the Schacht motor buggy.

Pope's July Report—The report of the receivers for the Pope Motor Car Co., of Toledo, has been filed with the United States circuit court, covering the month of July, showing an increase in the cash balance of $24,545.51 during the period. There was total cash on August 1 amounting to $192,098.60. Goods amounting to $60,000 were sold, while the pay roll amounted to $13,000.

Making Cars, Too—The C. T. McCue Co., of Hartford, Conn., a factor in the horse carriage trade, has embarked in the motor car field and has already received an order from a southern source for thirty cars. The Billings & Spencer Co. is instrumental in the construction of these cars, furnishing the bulk of the parts. F. C. Billings, of this concern, is vice-president of the McCue company. The car, it is said, is to be known as the McCue-Hartford. The cars are assembled in Hartford, but not finished as regards painting and trimming. It is quite probable the McCue company will erect a garage in the western part of the city for its own use.

Takes E-M-F Territory—The Kansas City Studebaker branch has closed with the Lincoln Automobile Co., Lincoln, Neb., for E-M-F territory. From eighty-five to 125 cars may be taken.

Takes Bigger Store—Larger quarters have been obtained by the Overleese Tire Repair Co. at 118 West Ohio street, Indianapolis, where a large line of tires has been put in. The company was formerly at 23 East Ohio street, which has now been taken by the Knickerbocker Automobile Co.

Given More Territory—The Penn Motor Car Co. of Philadelphia has been so successful in promoting the interests of the Mitchell car in that city and its immediate vicinity that the factory has decided to add to the company's territory a considerable portion of eastern Pennsylvania, southern New Jersey and Delaware. The additional territory will necessitate the immediate enlargement of the quarters at 138 North Broad street, and work on the alterations will be begun in a short time.

Show at Hartford—The original intention of the Hartford Automobile Dealers' Association to hold a show under a large tent during the week of the state fair and grand circuit horse races has been abandoned and the exhibition will be housed beneath the roof of the skating rink at Luna park adjoining the fair grounds. The floor space is the same. Every square inch of space has been sold and several local dealers who were a bit backward are left out in the cold. One concern has offered a bonus for space. The committee has endeavored to secure more room, but without success. All that is necessary to make the show a success is good weather, which usually prevails horse race week.

SHOWING RAMBLER SYSTEM IN PARTS ORDER DEPARTMENT

Assistant to Croninger—H. B. Odell, formerly with the Mora company, has taken a position as assistant to R. Harry Croninger, general manager of the Pennsylvania Auto Motor Co., of Bryn Mawr, Pa.

Gives Up the Midland—The Allenhurst garage has discontinued the agency of the Midland car and the managers, B. L. Toplitz and D. Holmes, are now in the west concluding arrangements for the exploitation of the product of another line of cars.

Company Reorganizes—The Ford Automobile Equipment Co., 1424-1426 Michigan avenue, Chicago, successor to the Auto Equipment Co., has recently reorganized. The concern is handled now by Erwin Ford, president, and Philip Steele, secretary. The firm will carry tops, wind shields, etc.

Studebakers in Milwaukee—The Studebaker will have a new home in Milwaukee when the garage being erected by the agents, George F. Garlach and Charles P. Mayhew, at 82-4-6 Farwell avenue, is completed. The partnership will also handle the E-M-F. The place will be known as the Ogden-Farwell garage.

New Milwaukee Garages — Eugene Wuesthoff, of Milwaukee, is building a garage at Thirteenth street and Grand avenue in that city. The dimensions are 48 by 155 feet, one-story high, of brick construction. Richard J. Penney and J. J. Richards, of Milwaukee, have opened a garage at 312 West North avenue, Milwaukee. A repair and supply department has been added. There is room for twenty cars in this place.

Indianapolis Garage Opens—The Willis-Haywood-Holcomb Co. threw open its new garage at 330 North Illinois street, Indianapolis, on September 1. The firm kept open house and entertained visitors, who were shown through the various departments of the three-story building. Next season the company will have the Indiana agency for the Packard. C. C. Marble has been engaged to take charge of the tire department.

After Waverley Plant—A cash offer for the Waverley plant of the Pope Motor Car Co. at Indianapolis has been made by Herbert H. Rice and Wilbur C. Johnson, manager and assistant manager of the plant. The offer was made on behalf of a syndicate organized some time ago, the personnel of which Mr. Rice will not divulge until the court has acted on the petition. A report filed in the federal court at Indianapolis a few days ago shows that during July the receipts were

$32,600.87 and the disbursements $22,148.32. Should the offer to take the plant be accepted, it is rumored that some decided changes will be made at the plant.

Chicago Concern Moves—The Murray Machine Works, of which William Murray is president, recently moved to larger quarters at 353 Wabansia avenue, Chicago, where they will continue the manufacture of parts.

Johnson Needs More Room—The Winton branch at Minneapolis will soon be permanently housed in its own new building on Eighth street north, near Hennepin avenue. The development of Winton trade in Minnesota since John S. Johnson took hold last spring has exceeded expectations and rendered the temporary quarters altogether inadequate; hence the new building in that city.

Moves Into New Place—The Indiana Automobile Co., Indianapolis, is moving into the new addition to its garage and sales room, the addition fronting on Massachusetts avenue. With the improvement, the company now has 17,000 square feet of floor space and has installed a paint shop. The first floor is to be devoted to a show room, garage and offices, the repair and paint shops to be located on the second floor.

Will Use Gasoline Motors—The first interurban company in Indiana to operate gasoline motor-driven cars exclusively, will be the Elwood and Swayzee Traction Co., which has just obtained a franchise between the two cities. The distance is 17 miles and cars of the interurban type, equipped with four-cylinder gasoline water-cooled engines, will be employed instead of cars driven by electricity. The line will be in operation early next year as little work will have to be done besides placing the rails.

Rambler System—Thomas B. Jeffery & Co., makers of the Rambler, have on hand a duplicate of every part of every Rambler ever manufactured since 1902, and they make the claim that they can ship replacements on the same day the order reaches the factory. Such promptness is due to the organization of the sundry department. Orders are received by the parts-order department and sent to the sundry department for filling. Here the parts ordered are inspected by two men to insure accuracy. Again in the shipping room the order is time-stamped and double-checked to avoid mixing orders in packing. Parts of each and every piece ever used in any Rambler car are carried in stock. The sundry department has 2,288 square feet of floor space and has 1,500 bins of various sizes, all arranged in sections 8 feet in height. In this room are found only such parts as are most frequently in demand, while in a reserve stock room, with 3,280 square feet of floor space, other parts are kept. In addition there is the annex, motor stock, transmission stock and axle stock rooms, having a combined floor space of 5,210 square feet. In the Rambler parts list there are nearly 8,000 distinct parts, these covering, of course, all models built since 1902.

Lufkin Returns—J. W. Lufkin, who was with the White company in Boston for several years, and a year ago left to go with the Peerless, has returned to his old firm again and is now working for Manager J. S. Hathaway.

Reeves Ready for Work—Alfred Reeves, general manager of the American Motor Car Manufacturers' Association, who has been recuperating in the wilds of Maine for the past 3 weeks, will return to New York Friday. Mr. Reeves is greatly improved in health.

Avery Branch Moves—The New York branch of the Avery Portable Lighting Co., of Milwaukee, Wis., maker of the Autogas tanks, has moved from 51 West Sixty-third street to the new Thoroughfare building, occupying that part numbering 243 and 245 West Fifty-seventh street.

Bendix May Move—The Bendix Automobile Co. of Chicago contemplates moving to Logansport if satisfactory arrangements can be made with the Logansport Industrial Association. Citizens of Logansport are asked to subscribe for $75,000 worth of stock in the company with a guaranteed dividend of 6 per cent and $20 worth of common stock with each $100 worth of preferred. In return the company agrees to establish a plant emplaying 200 men by January 1.

Increases Capital Stock—The Denver Auto Goods Co. has increased its capital stock from $10,000 to $25,000, and fully paid up. Five years ago $3,500 was the total capital stock. The increase in the capital stock has been made necessary through rapid growth of the motor car interests in Colorado and adjoining states of the Rocky mountain region, which territory is well covered by the company. Itemized, it is found that Colorado has 4,080 cars, New Mexico 800, Utah 1,000, Wyoming 400, Kansas 2,500, Nebraska 2,000 and Texas 2,000, and over this field the company operates.

Plummer Back in Boston—F. G. Plummer has joined the forces of the Buick company in Boston after having been in Seattle 2 years. Previous to that time he worked in Boston as a salesman for motor cars. During his last season in Seattle he made a record by selling fifty-one machines of one make there.

Joins Winton Ranks—George H. Smith, formerly manager of the White branch house in Philadelphia, has been engaged by the Winton Motor Carriage Co. to cover its eastern territory. Mr. White has an extensive knowledge of gasoline machines, having represented the Packard in New York city before going with the White concern.

Palmer & Singer Plans—The Palmer-Singer Six-Sixty, a six-cylinder 60-horsepower car, and the Skimabout, a 30-horsepower four-cylinder runabout, are the first models shown by their makers for the season of 1909. The present factory plans comprehend the construction of 250 cars of each of these models, with a prospective 125 cars each of the remaining three types. It is the intention of the Palmer & Singer company to build in the neighborhood of 1,000 cars for 1909.

Change in Glens Falls—The Glens Falls Automobile Co., Glens Falls, N. Y., which has been occupying a frame building on Bay street, has moved into its new garage, which has just been completed. The building is situated at the top of the Glen street hill and is a three-story brick and concrete building, an electric elevator connecting each floor. It has storage accommodation for 100 cars and is heated by steam. The company has the agency for the Thomas Flyer and its officers are Edward F. Irish, president and secretary; W. Irving Griffing, vice-president; William L. R. Durkee, treasurer.

EACH SPARE RAMBLER PART IS KEPT IN SEPARATE BOX

Brief Business Announcements

Menasha, Wis.—Wheeler's garage has been opened here.

Los Angeles, Cal.—E. L. De Camp is preparing to open an agency for the Continental Tire Co. in this city.

Beloit, Wis.—Alonzo Aldrich is erecting a large garage on Bluff street, to cost $3,000.

Sheboygan, Wis.—H. E. Smith, of Fond du Lac, has opened a garage at 721 Erie avenue. He will establish a large repair department.

Grand Rapids, Wis.—H. W. Kaskaska, of Stevens Points, Wis., has opened a repair shop on Seventh avenue south and may later establish a garage.

Glens Falls, N. Y.—The new garage, which has been in course of erection for Joubert & White, is now completed, and they will take possession at once.

Los Angeles, Cal.—The Standard Motor Car Co., which has the local agency for the Ford company, is now located in its new quarters at Twelfth and South Olive streets.

New London, Conn.—The W. D. Forbes Co., which is engaged in the manufacture of engines and motors, is erecting a new plant which is expected to be ready for occupancy soon.

Newark, N. J.—J. H. Quimby & Co., of this city, have closed a contract with the Isotta Import Co., of New York city, and will act as agent for the Isotta Fraschini in the state of New Jersey.

Merrill, Wis.—Norman Chilson has established a garage here. He is now remodeling his bicycle store at 305 East Main street and will have a floor space of 30 by 50 feet. This is the first garage in Merrill.

Albany, N. Y.—The J. H. Lehman Mfg. Co., of Brooklyn, has been incorporated with a capital stock of $25,000, and will engage in the manufacture of ignition devices for combustion engines, and motor car materials.

New York—The B. F. Goodrich Co. is to erect a six-story building for its metropolitan headquarters. It has purchased the building at 1776-1778 Broadway, now occupied by the Stoddard-Dayton, Renault and Ajax-Greib people, and will erect a new building for its own use exclusively.

Detroit, Mich.—Numerous offers have been made to the Motor Car Co., manufacturer of the Carter car, giving inducements for the removal of the works from this city. One of the offers come from an Ohio city, and another from a city in this state, and it is said that the latter is receiving serious consideration, and that the company has almost decided to accept it, though no decision has been arrived at as yet, nor has any definite information been given out.

Hartford, Conn.—F. H. Bogart has assigned to the Hartford Automobile Parts Co. a patent for a universal joint.

Hartford, Conn.—The Pine Inn and Garage Co., of Westport, has been incorporated with a capital stock of $1,000.

Pittsburg, Pa.—In the future the Chalmers-Detroit car will be represented in this city by the Banker Brothers company.

Chicago—The Kramer Motor Car Co., which has the local agency for the Midland, is to open a new garage at Evanston and Montrose avenues.

Philadelphia, Pa.—A permit has been granted to Bergdoll & Pawling for the erection of a three-story brick garage, 77.10 by 71 feet, on Wood street, for Louis J. Bergdoll.

Binghamton, N. Y.—L. L. Heller, who has the local agency for the Ford, has opened a new establishment at 30 Court street, and will carry a full line of motor car tires and supplies.

Los Angeles, Cal.—C. E. Smith, who has been acting as traveling representative of the Fisk company, has made arrangements to make this city his headquarters. Previously the entire southern California territory has been handled by C. O. Du Mars, but in the future he is to be assisted by Mr. Smith.

New York—Detroit Cadillac Motor Car Co., capital stock $5,000, to deal in motor cars. Incorporators, H. B. Pottwer, New York city, and S. Racine and W. C. Leland, Detroit, Mich.

Louisville, Ky.—Motor Van Co., capital stock $3,000. Incorporators, D. L. Miller, J. H. Robinson and D. H. Long.

Cleveland, O.—Butler-Clark Auto Service Co., capital stock $10,000. Incorporators, J. W. Butler, E. H. Clark and P. L. Miller.

Lowell, Mass.—Lowell American Automobile Co., capital stock $100,000, to deal in motor cars. Incorporators, G. S. Rubin, who is the president of the company, and E. Hardy, of Welleston, who is to act as treasurer.

New York—Crescent Auto Co; capital stock, $1,000.

Boston, Mass.—Sectional Rubber Tire Co.; capital stock, $50,000; to deal in motor vehicles.

Boston, Mass.—Commonwealth Garage; capital stock, $5,000; to operate a garage, deal in machinery, etc. S. A. Holt is the president of the concern.

La Salle, Ill.—La Salle Garage Co.; capital stock, $6,000; to manufacture and repair motor cars.

Plattsburg, N. Y.—Aldridge Roller Bearing Mfg. Co.; capital stock, $200,000; to manufacture bearing axles for vehicles of all kinds.

New York—Central Garage and Machine Works; capital stock, $5,000; to manufacture motors, engines, cars, carriages, boats, vehicles, etc.

Jersey City, N. J.—Taxi Motor Cab Co. of Boston; capital stock, $500,000; to manufacture cars, carriages, wagons, boats and vehicles of all kinds.

San Diego, Cal.—An agency of the White company has been established here under the management of Earl Pfeifer.

Springfield, Ill.—The Perfection Emergency Tire Co., of Chicago, has been incorporated with a capital stock of $25,000, and will manufacture tires of all kinds.

Newark, N. J.—J. H. Ramsdell has retired from the Livingston-Ramsdell Motor Car Co., and in the future the concern will be known as the Livingston Motor Car Co.

Albany, N. Y.—The Suburban Auto Express Co., of New York city, has been incorporated with a capital stock of $25,000, and will do a transfer and express business in this city.

Clyde, Kan.—Roy B. Graham has opened a new garage at this point and will handle the Cadillac line exclusively, with Cloud, Clay, Washington and Republic counties as territory.

Philadelphia, Pa.—The Fiat Automobile Co. of New York has opened a branch in this city. It will make its headquarters at 514 North Broad street under the management of Cornelius Barrows.

Dover, Del.—The Co-Operative Garage Co., which is a New York corporation, has been incorporated under the laws of this state with a capital stock of $150,000, and will acquire and dispose of motor cars and vehicles of all kinds.

Pittsburg, Pa.—Application will be made for a charter for a concern to be known as the Auto Lift Co. The object of the new concern is to be the manufacture of iron and steel as well as motor car and other vehicles and all devices for lifting the same.

New York—Guy Hutchinson, who has been acting as manager of the local branch of the Corbin company, has been promoted to factory sales manager and will be succeeded here by H. B. Tucker. Mr. Tucker was formerly in charge of the local repair department.

Oregon City, Ore.—C. G. Miller, who is the proprietor of a gun and sporting goods establishment on Main street, is to build a garage and repair shop in the rear of his present store. He will make arrangements for the agency of several high-grade cars and will also carry a line of supplies and accessories.

Boston, Mass.—In the future the Stranahan-Eldridge Co. will have its garage and repair shop on Irvington street, and the salesroom formerly occupied by the concern on Boylston street will be closed. The company has also given up the agency for the Buick car, which it has been representing for some time.